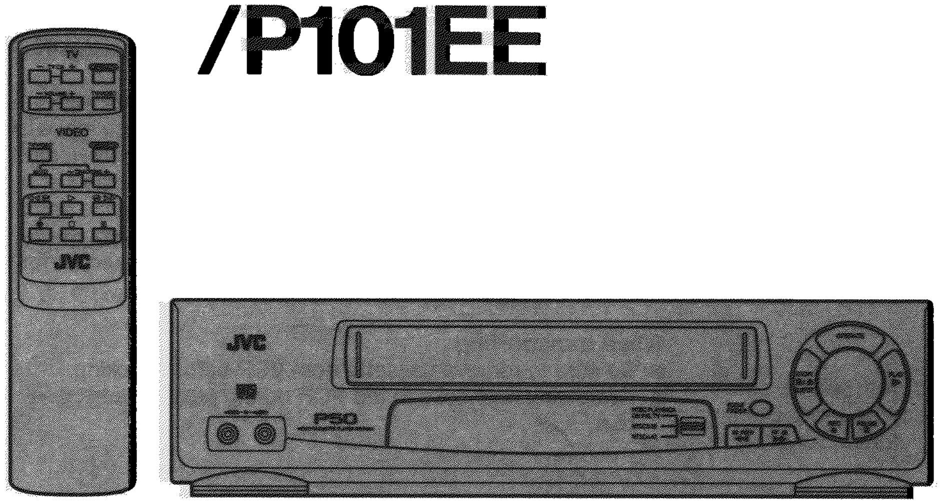
SERVICE MANUAL

VIDEO CASSETTE PLAYER

HR-P40A/P50A/P60K/P70K /P101EE



PAL NTSC

SPECIFICATIONS *(The specifications shown pertain specifically to the model HR-P50A)*

Format	VHS Standard
Video recording system	Rotary, slant azimuth two-head helical scan system
Rotary heads	2 video heads
RF output	System G/K type modulation UHF ch 32 – 40 adjustable (preset ch 36)
Recording (line input)	PAL, SECAM (MESECAM tape) NTSC 3.58, NTSC 4.43
Playback (line output)	PAL, SECAM (MESECAM tape) NTSC 3.58 NTSC 4.43 Simulated PAL (NTSC tape)
Video	
Line input level	0.5 – 2.0 Vp-p/75 ohms, unbalanced
Line output level	1.0 Vp-p/75 ohms, unbalanced
S/N ratio	More than 46 dB
Horizontal resolution	More than 250 lines
Audio	
Line input level	–6 dBm/50 k ohms, unbalanced
Line output level	–6 dBm/1 k ohm, unbalanced
Frequency response	100 Hz to 10,000 Hz
Recording/Playback time	
CCIR	240 min. with E-240 cassette
NTSC	160 min. with T-160 cassette
Tape speed	
CCIR	23.39 mm/sec.
NTSC	33.35 mm/sec.
FF, REW time	Approx. 2 min. 30 sec. with E-180 cassette
Power requirements	
Rating	AC 110 – 240 V, 50/60 Hz
Operating	AC 90 – 260 V, 50/60 Hz
Power consumption	20 W
Operation temperature	5°C to 40°C
Dimensions	360 (W) × 94 (H) × 310 (D) mm
Weight	3.6 kg

Standard accessories

Remote control unit	1
Batteries for remote control	2
RF antenna cable	1
Plug adapter for power cord	1

- For improvement purposes, specifications and design are subject to change without notice.

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The following table lists the differing points between Models (HR-P101EE,HR-P40A,HR-P50A,HR-P60K and HR-P70K) in this series.

	HR-P101EE	HR-P40A	HR-P50A	HR-P60K	HR-P70K
KARAOKE,MIC	×	←	←	○	←
RF CONV	G/K	←	←	←	I/K
FRONT A/V INPUT TERMINAL	×	←	○	×	←

Note: ○:USED ×:NOT USED

Mark ← is same as at left.

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded ( ) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

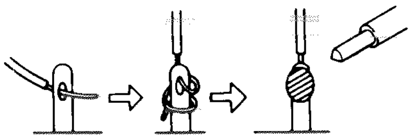


Fig. 1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

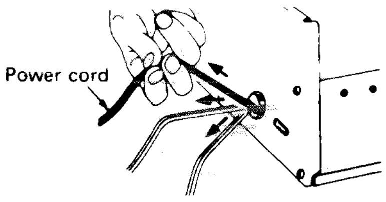


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
    1) **Connector part number** : E03830-001
    2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

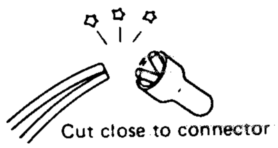


Fig. 3

       (2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

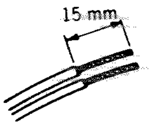


Fig. 4

       (3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

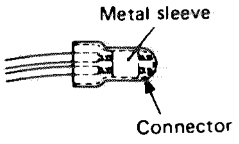


Fig. 5

       (4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

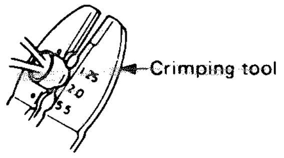


Fig. 6

       (5) Check the four points noted in Fig. 7.

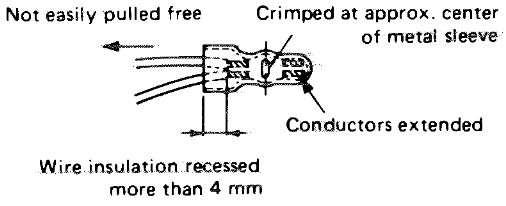

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
   Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. **Dielectric strength test**
   Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. **Clearance distance**
   When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

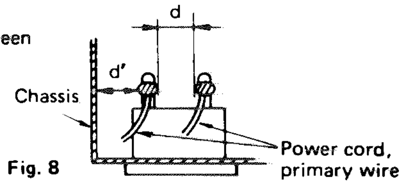


Fig. 8

4. **Leakage current test**
   Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
   Measuring Method: (Power ON)
   Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

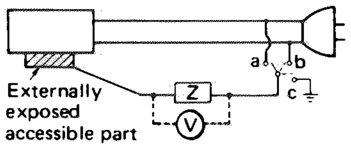


Fig. 9

5. **Grounding (Class I model only)**
   Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
   Measuring Method:
   Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

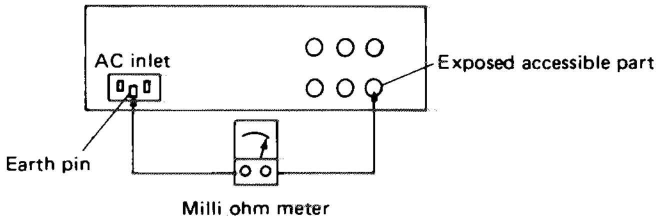


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	–	AC 1 kV 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ /500 V DC	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

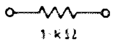
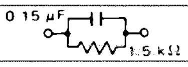
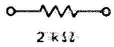
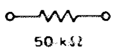
AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan		i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada		i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia		i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
			i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

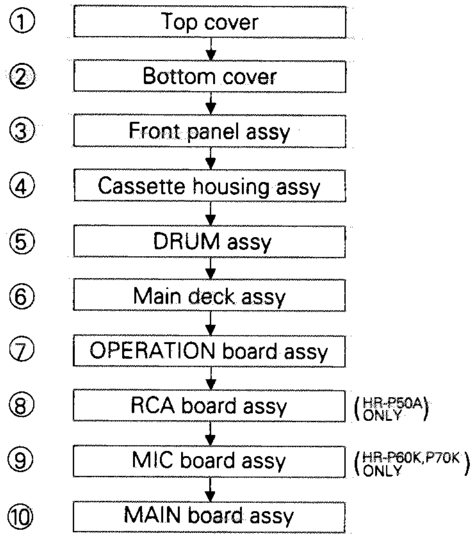
Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

SECTION 1
DISASSEMBLY

1.1 DISASSEMBLY FLOW CHART

This flowchart shows lists the disassembly steps for the cabinet parts and P.C. boards in order to gain access to item(s) to be serviced. When reassembling, perform the step(s) in order. Bend,route and dress the flat cables as they were originally.



1.2 HOW TO READ THE DISASSEMBLY AND ASSEMBLY

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	5(S1)	
②	BOTTOM COVER	D2	(S2), 9(L1), 2(P1)	
③	FRONT PANEL ASSY	D3	7(L2)	<NOTE 1>
④	SW/JACK & SW/DISPLAY BOARD ASSIES	D4	12(L3),*CN1, *CN2	<NOTE 2>
⑤	CASSETTE HOUSING ASSY	D5	4(S3)	<NOTE 3>
⑥	PRE/REC BOARD ASSY	D6	2(S4),*CN1 *CN201,*CN202 SHIELD CASE	

(1) (2) (3) (4) (5)

(1) Order of steps in Procedure
When reassembling, perform the step(s) in the reverse order. These numbers are also used as the identification (location) NO. of parts Figures.
(2) Part name to be removed or installed.
(3) Fig.No. showing procedure or part location
(4) Indentification of part to be removed,unhooked,unlocked, released,unpluged,unclamped or unsoldered. P = Spring, W = Washer, S = Screw, L = Locking tab, * = Unhook,unlock, release,unplug or unsolder.
(5) Adjustment information for installation

1.3 DISASSEMBLY/ASSEMBLY METHOD

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	4(S1)	
②	BOTTOM COVER	D2	(S2), 6(L1)	
③	FRONT PANEL ASSY	D3	7(L2)	<NOTE1>
④	CASSETTE HOUSING ASSY	D4	2(S3), 2(S4)	<NOTE3>
⑤	DRUM ASSY	D5 D6	(S5),(S6),3(S7) WR1,(L3) 4(L4) INERTIA PLATE HEAD CLEANER SHIELD CASE	<NOTE2>
⑥	MAIN DECK ASSY	D7	2(S8),WR2 WR3,2(L8),CN504	
⑦	OPERATION BOARD ASSY	D8	6(L5),*CN801	<NOTE2>
⑧	RCA BOARD ASSY	D8	6(L6),*CN701	<NOTE2> (HR-P50A)
⑨	MIC BOARD ASSY	D8	(S9) SPRING	<NOTE2> (HR-P60K P70K)
⑩	MAIN BOARD ASSY	D8	4(L7)	

<NOTE1>
When reattaching the front panel assy, make sure that the door opener of the cassette housing assy is lowered in position prior to the reinstallation.

<NOTE2>
When plugging the connector in, check that the flat wire is inserted properly and fully.

<NOTE3>
When reattaching the cassette housing assy, pay careful attention to the switch lever not to make it touch the REC switch knob of the MAIN board assy from the upside.
(If the REC switch knob of the MAIN board assy is damaged, cassette loading is impossible.)

<NOTE4>

- When removing the Main deck assy only, unhook the two spacers connecting it with the Main board assy with pliers from the back side of the Main board assy first, and then remove the Main deck assy.
- When reattaching the Main deck assy to the Main board assy,make sure to set the spacers into the retaining slots respectively.

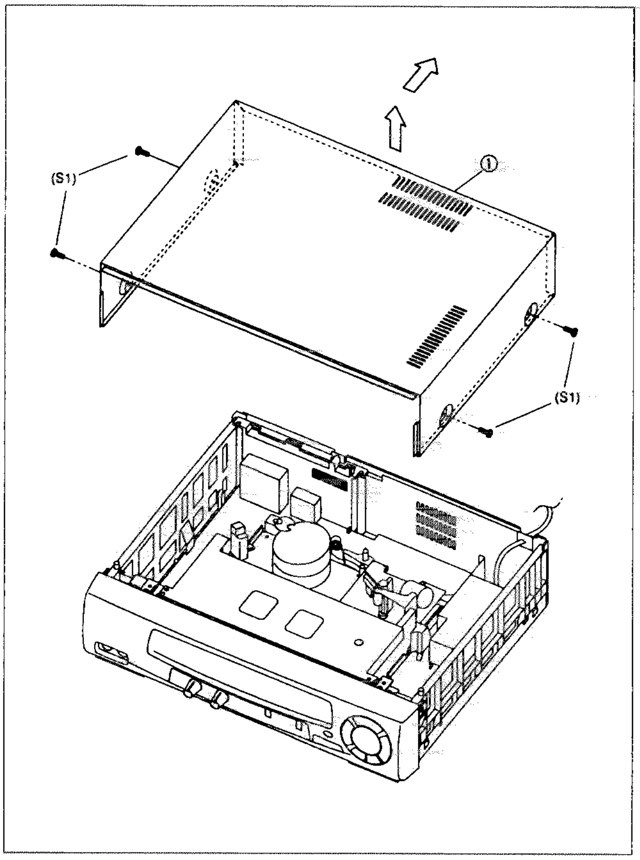


Fig. D1

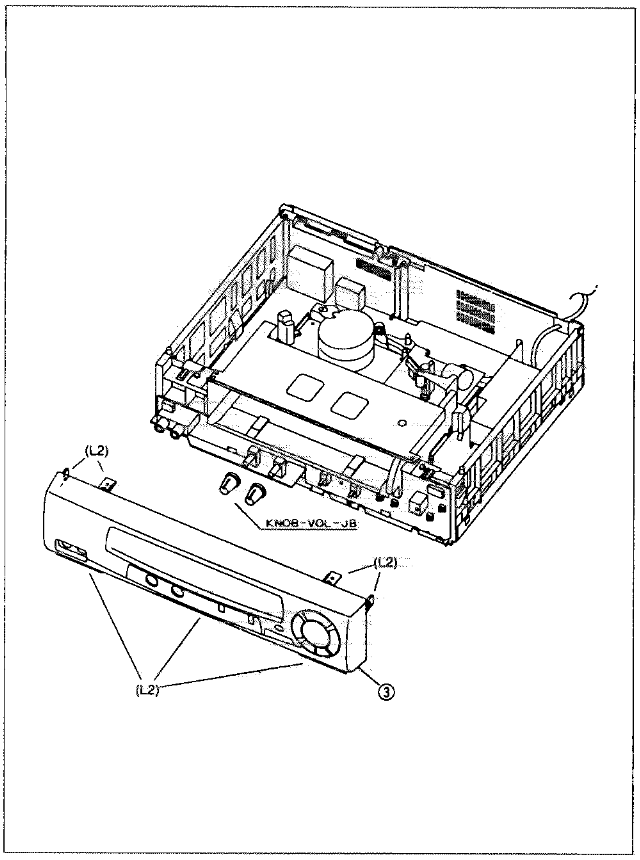


Fig. D3

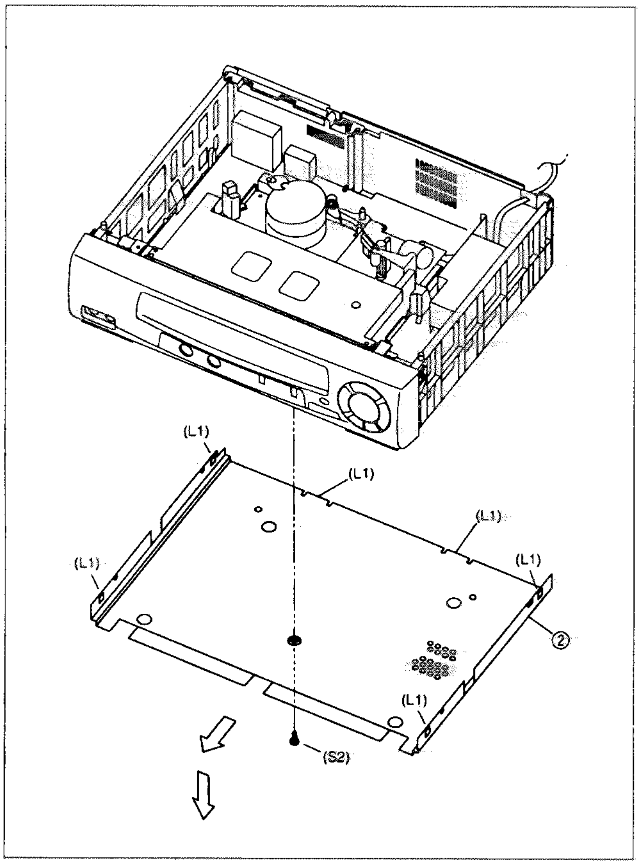


Fig. D2

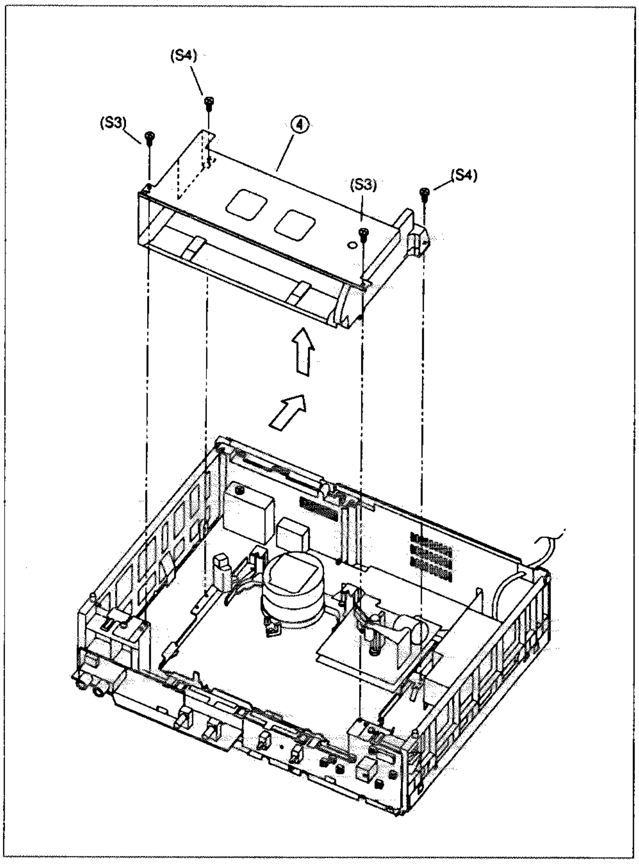


Fig. D4

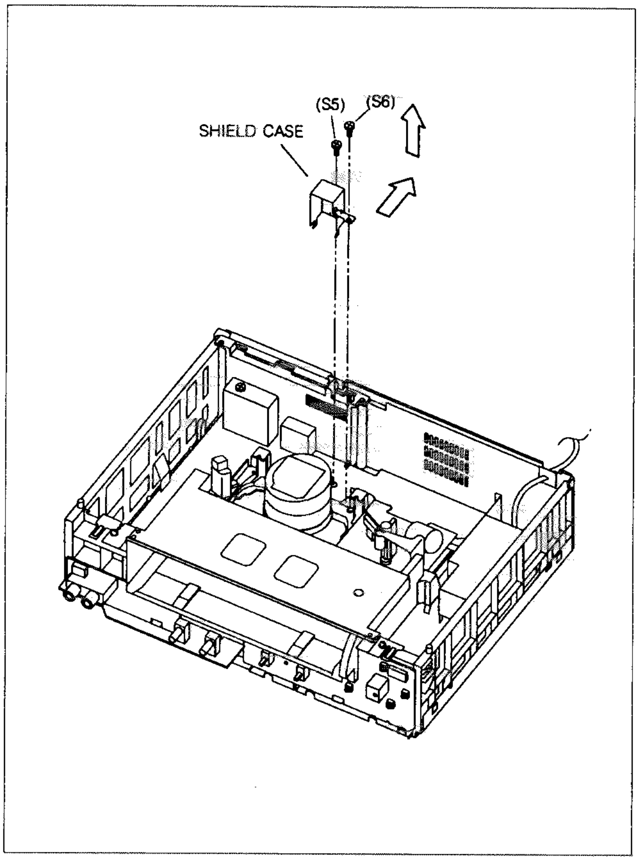


Fig. D5

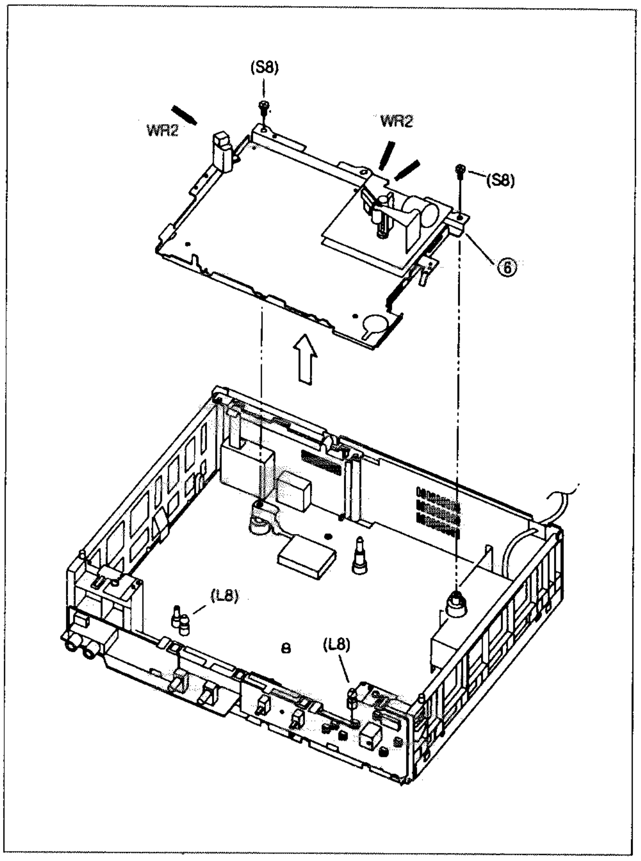


Fig. D7

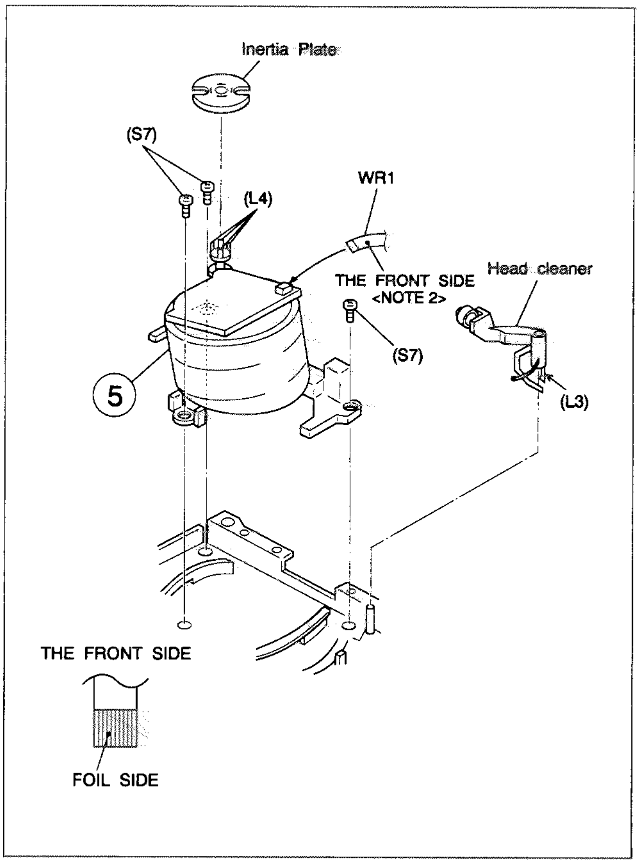


Fig. D6

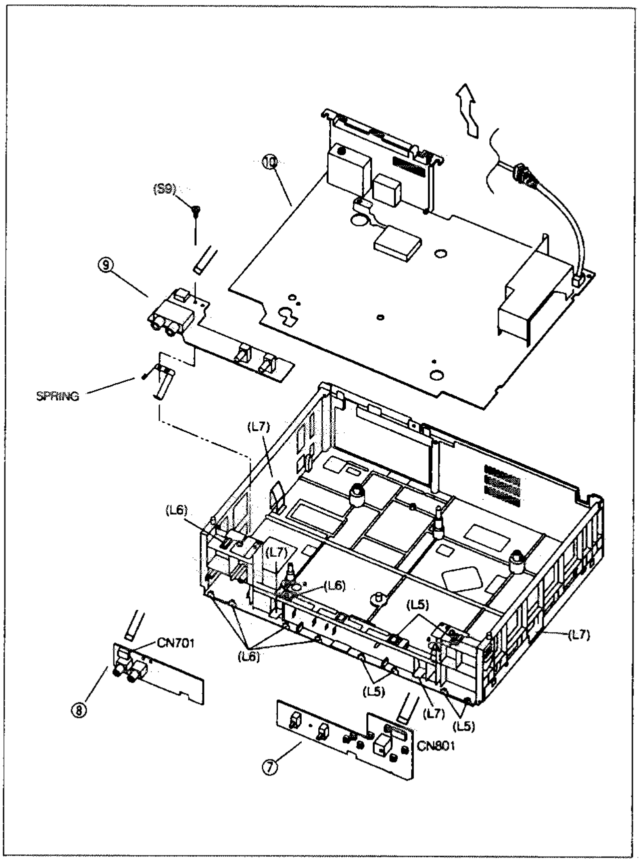


Fig. D8

1.4 CASSETTE HOUSING INSTALLATION

NOTE: *Observe the mechanical phase and position (see figure) when installing the cassette housing assembly. If these are incorrect, the system will not operate properly even when tape is inserted.*

1. Check that the hole of the control cam are aligned to the deck hole. If necessary, turn the mode motor belt by hand to adjust the position.

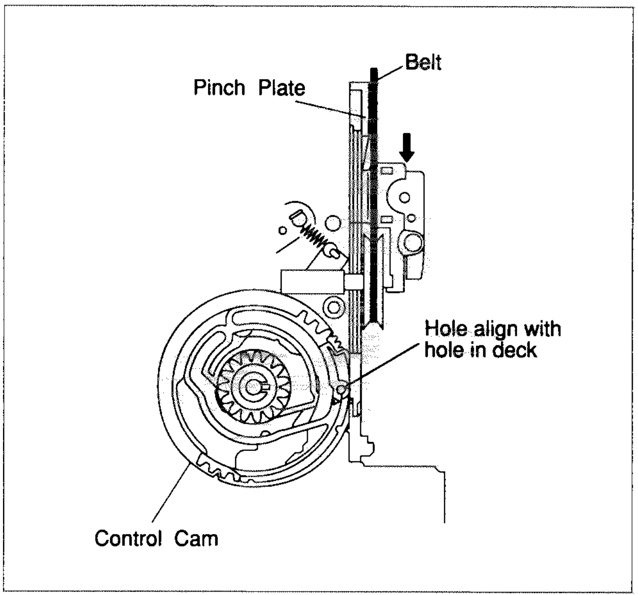


Fig. 1-4-1

1.5 SERVICE POSITION

1.5.1 How to take out the Mechanism and Main board assemblies.

(1) Remove the Top cover, Front panel assy and CN601 (*CN701) of the MIC (*RCA) board assy.

(2) Take out 2 screws Ⓐ and 2 screws Ⓑ as shown in Fig.1-5-1.

NOTE : Mark (*) is used the model HR-P50A

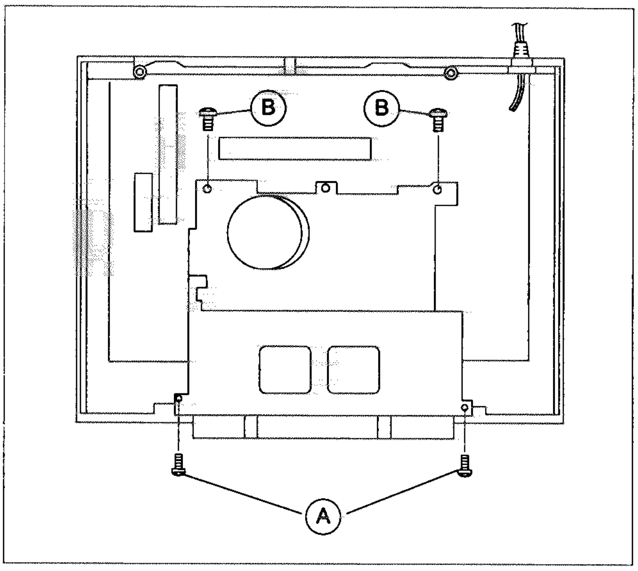


Fig. 1-5-1

(3) Disengage 4 claws ⓐ from the chassis.

(4) Remove the Mechanism assy (including Cassette housing) and Main board assy out of the chassis as shown in Fig. 1-5-2.

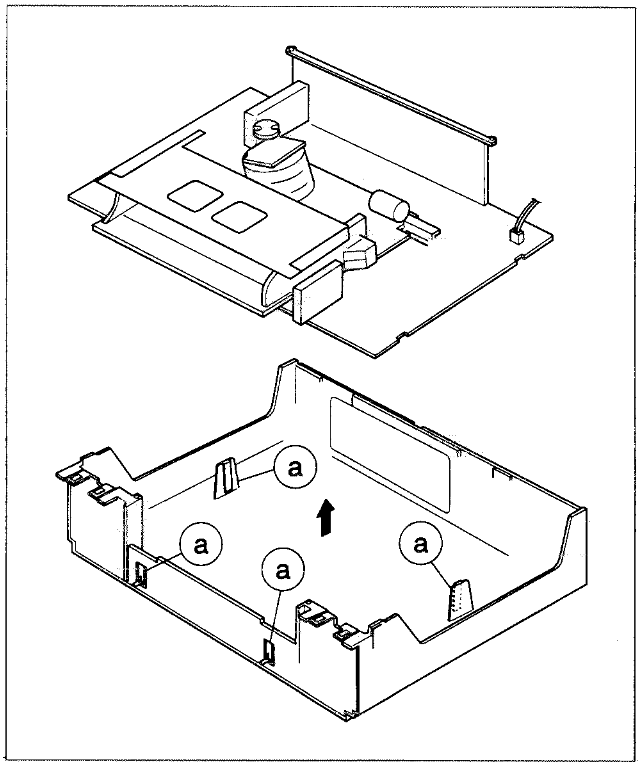


Fig. 1-5-2

(5) Turn over the Mechanism assy and Main board assy.
(6) Carry out checks & repairs as necessary as shown in Fig.1-5-3.

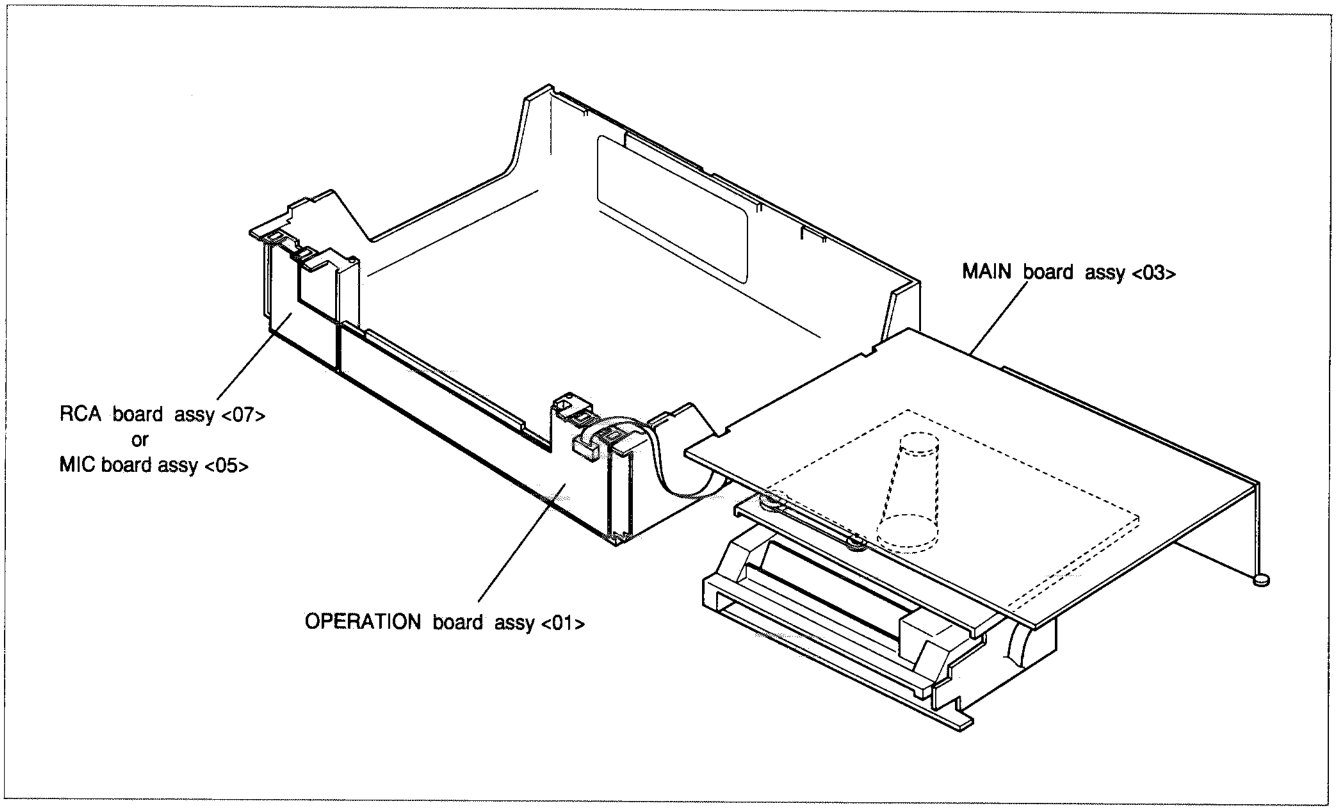


Fig. 1-5-3

1.6 MECHANISM SERVICE MODE

This model has a unique function to enter the mechanism into every operation mode without loading of any cassette tape. This function is called the "MECHANISM SERVICE MODE".

1.6.1 How to set the "MECHANISM SERVICE MODE"

(1) Remove the Top cover and Front panel assy . (See Page 1-2)

(2) Connect TP104 (GND) and TP502 (SERVICE) on the MAIN board assy with a jump wire.

(3) Press the POWER button.

(4) Select the desired operation modes with the operation buttons or remote controller.

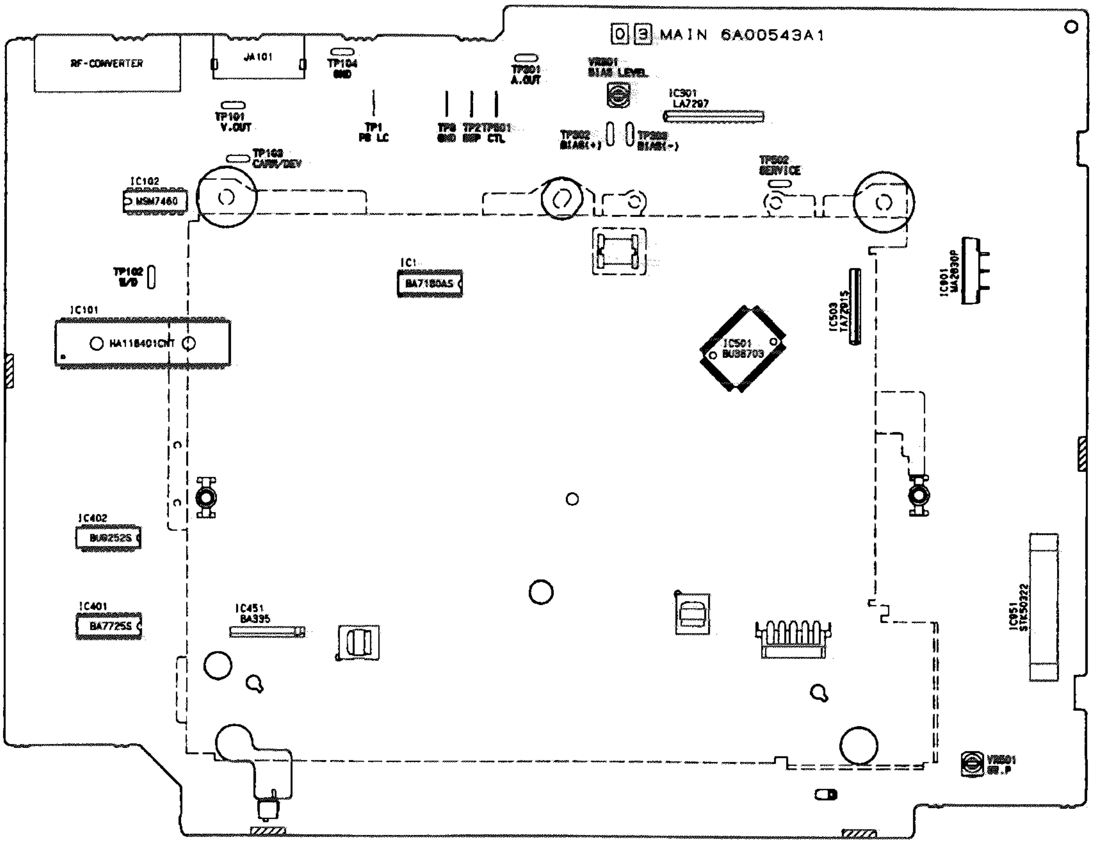


Fig. 1-6-1

1.7 EMERGENCY DISPLAY FUNCTION

This product has the function to indicate the emergency faults which can be displayed in the LED when servicing.

1.7.1 How to display record of an emergency faults

(1) Connect TP502 (SERVICE) and TP104(GND) on the Main board assy with a jump wire so the emergency faults are shown in the LED.

(2) Disconnect a jump wire to return to the normal mode.

1.7.2 Detail of emergency faults

EMG DATA	Symptom	Detect mode	Resulting mode
E 01	Loading motor rotates for more than 8 Sec without shift to next mode.	Loading or UnLoading	POWER OFF
E 02	TU or SUP REEL FG input is absent (for more than 4 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E 03	DRUM FF input is absent(for more than 3 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP
E 04	CAPSTAN FG input is absent(for more than 1 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF

Table 1-7-1 EMERGENCY FAULTS-1

EMG DATA	REC LED	PLAY LED	OPERATION LED
	(RED)	(GREEN)	ORANGE
E 01	Blink	L	H
E 02	H	L	H
E 03	L	L	H
E 04	L	H	H

H : Light on L : Light off

Table 1-7-2 EMERGENCY FAULTS-2

SECTION 2
MECHANISM ADJUSTMENT

2.1 PREPARATION

2.1.1 Precautions

(1) Disconnect VCR from AC power before soldering.
(2) Avoid imparting stress to wires when disengaging connectors.
(3) Determine and correct the cause of difficulty before proceeding to adjustments.Do not disturb settings unnecessarity.
(4) Use care not to damage tabs,claws,etc during repairs.
(5) Install the cassette housing assy only when the mechanism is in the MECHANISM ASSEMBLING MODE position.
(6) When installing the Front panel assy,be sure to engage the housing door with the door opener of the cassette housing assy.
If this is omitted,the cassette door will not open at Eject and the cassette can not be removed. (See SECTION 1 DISASSEMBLY.)

2.1.2 Check without cassette housing assy.

Mechanism operations can be observed easily by removing the cassette housing assy. Use the MECHANISM SERVICE MODE (See SECTION 1 DIASSEMBLY)

2.1.3 Manual removal of loaded tape

When the deck enters the emergency mode with cassette tape loaded and it can not be ejected by pressing the EJECT button,take out of the cassette tape according to the following procedure.

(1) Disconnect the power cord from AC outlet then take out the Top cover and Front panel assy.
(2) Turn the mode motor on the Main deck assy by hand in the unloading direction to where the pole base assy (supply and take-up) is positioned below the cassette tape.At that time, pay careful attention to the tape not to get soiled with grease.
(3) Take out 4 screws of the cassette housing assy.(See SECTION 1 DISASSEMBLY)
(4) Remove the cassette housing with slackened tape and guard panel of cassette.
(5) Wind up the tape by turning the reel hub(either supply or take-up side for convenience) from the bottom of the cassette,and remove the cassette tape.

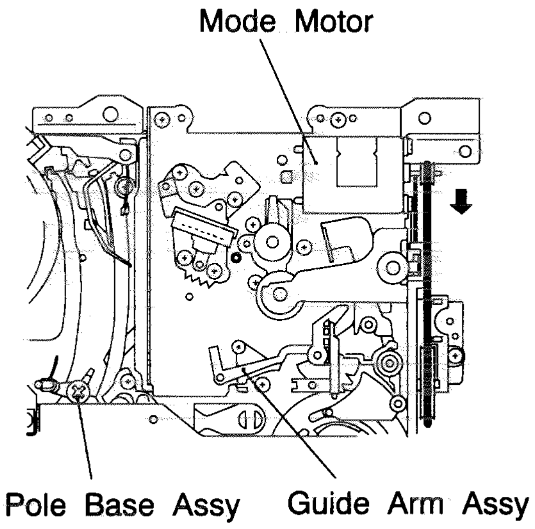


Fig. 2-1-1

2.1.4 Test Equipment

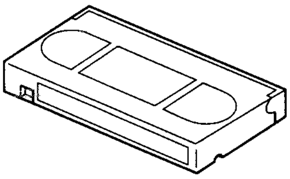
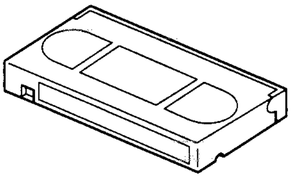
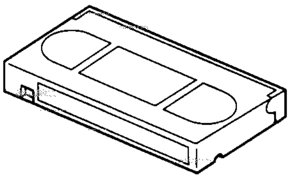
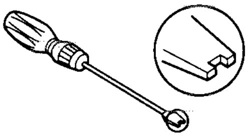
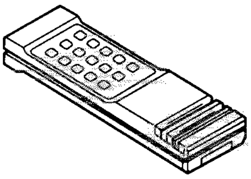
Alignment tape (SP) MHPE	Alignment tape (EP) MHPE-L	Back tension cassette gauge PUJ48076-2	A/C head positioning tool PTU94010
			
Roller driver PTU94002	Presetting unit PTU94008	Grease KYODO-SH-P	
			

Table 2-1 Test equipment

2.2 MAIN MECHANISM PARTS

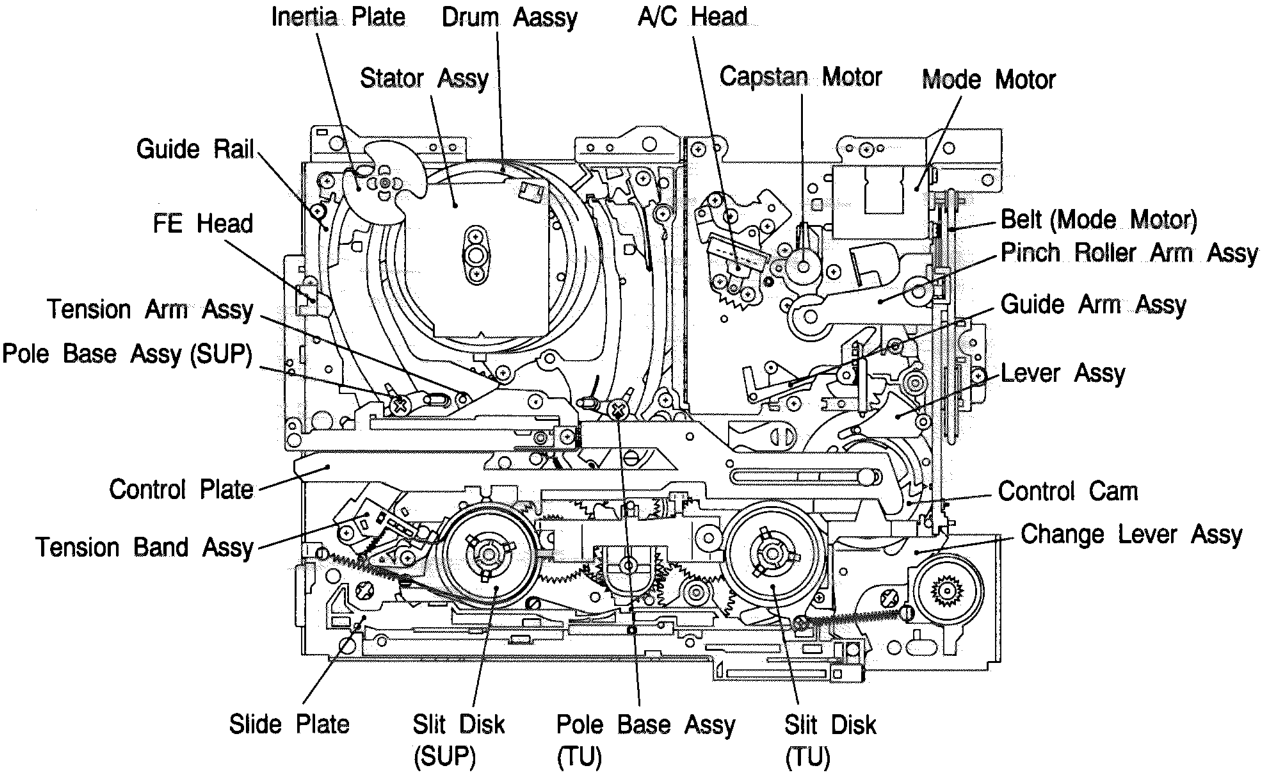


Fig. 2-2-1 Top view of main deck

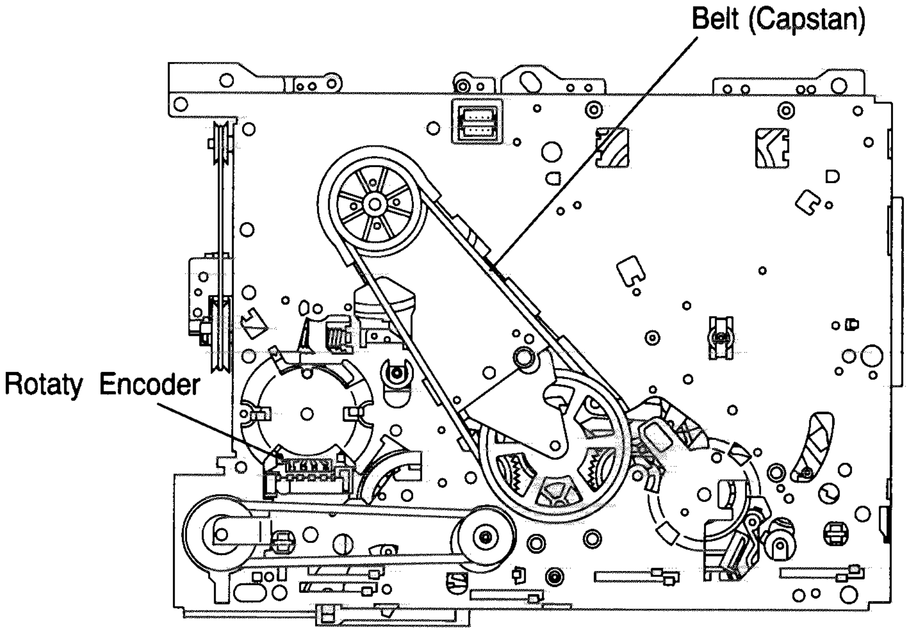


Fig. 2-2-2 Bottom view of main deck

2.2.1 Cleaning

Periodic cleaning of the tape transport system is desirable,but ordinarity not feasible in practice.Therefore,perform cleaning when a set is brought in for repairs or maintenance. Contamination of the video heads,tape guides and brush can detract from playback picture quality and in extreme cases,even damage the tape.For cleaning,use a finemesh cotton cloth(about the texture of a while dress-shirt) moistened in alcohol. It is recomended to also clean thetape tension posts and capstan.

- To clean the video heads,press the moistened cloth gently against the upper drum with fingertip and turn the drum gy hand.
- Do not use a vertical stroke,as this may damage the heads.

2.2.2 Lubrication

Oil and grease do not normally require periodic replenshing. Apply only when replacing lubricated parts(also clean and replace lubrication of mating parts if soiled). For parts and points to apply oil and grease, refer to the exploded views of the mechanism assy. Before oiling,clean with alcohol.Apply one or two drops of oil. Avoid excess oil.

1. Table 2-2-1 indicates the oil and grease used in this set. Use these or recommended locally available equivalents.

Category	Part No.
Oil	COSMO-HV56
Grease	KYODO-SH-P

Table 2-2-1

2. Grease is not required for a replacement cassette housing assy,as this has been applied at the factory.

NOTE : *Stir grease that has been stored for an extended period.*

2.3 INSPECTION AND MAINTENANCE

This product employs rotary and moving parts which wear out in the course of usage.Periodic inspection, cleaning, lubrication and maintenance are therefore important for ensuring maximum performance. Worn parts must also be replaced as and when required.

2.3.1 Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning,lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions.However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary. Also note that rubber parts may deform in time,even if the set is not used.

System	Parts Name	Operation Hours	
		~1000H	~2000H
Tape transport	Upper drum assy	★○	○
	A/C head	★○	★○
	Lower drum motor assy	★	★○
	Pinch roller arm assy	★	★
	Full erase head	★	★
	Tension arm assy	★	★
	Guide arm assy	★	★
Drive	Capstan motor		○
	Belt (Capstan)	○	○
	Belt (Mode motor)		○
	Mode motor		○
	Slit disk (supply, take-up)		○
	Clutch unit (supply, take-up)		○
	Worm gear assy		○
	Control plate		○
	Slide plate		○
Other	Brush assy	★○	★○
	Tension band assy	○	○
	Rotary encoder		○

★ : Cleaning
○ : Inspection or Replacement if necessary

Table 2-3-1

2.4 DISASSEMBLY/ASSEMBLY PROCEDURE OF MECHANISM

2.4.1 Precaution before disassembling mechanism

This mechanism has an exclusive operation mode provided for disassembling and installation of the mechanism (MECHANISM ASSEMBLING MODE), and it is suggested to set the mechanism to this mode before disassembly and installation.The exclusive mechanism operation mode is not generally used and becomes available by manual setting only. Then this procedure starts with the condition that the cabinet parts,cassette housing assy and PRE/REC board assy have been removed.

2.4.2 How to set the exclusive mechanism operation mode (MECHANISM ASSEMBLING MODE)

(1) Turn the mode motor belt by hand.
(2) Confirm that the hole of the control cam are aligned to the deck hole as shown in Fig.2-4-1.

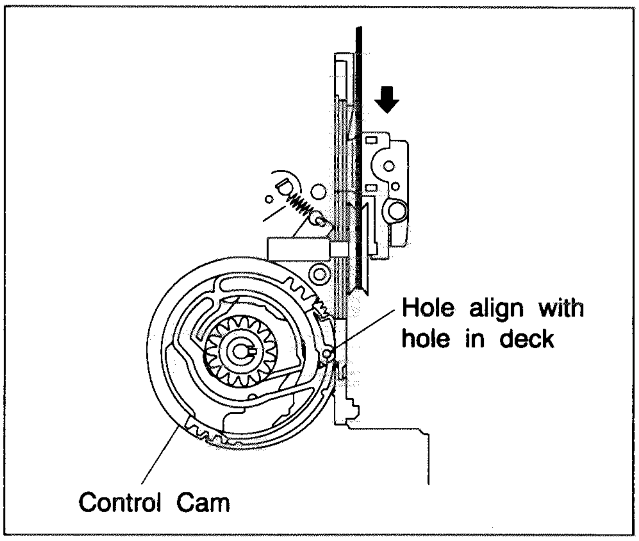


Fig. 2-4-1

2.5 MAIN PARTS REPLACEMENT OF MECHANISM

2.5.1 Pinch Rollar Arm ASSY

(1) Remove the slit washer.
(2) Tilt up the pinch rollar assy in direction of arrow.

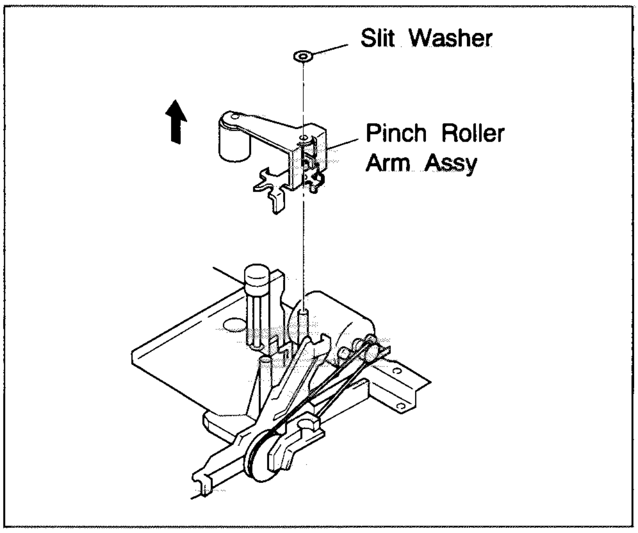


Fig.2-5-1

2.5.2 A/C Head

1. Removal

(1) Take out 2 screws (A).

(2) Remove the A/C head with head base.

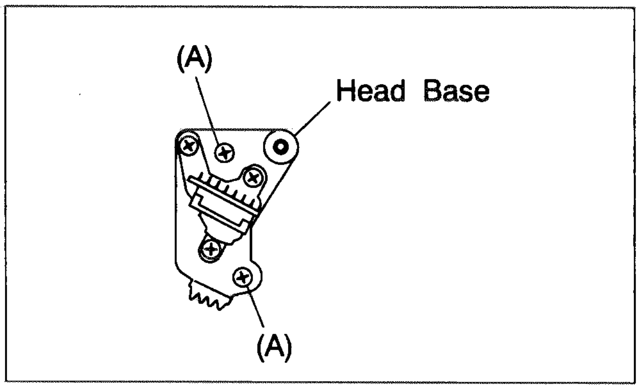


Fig.2-5-2

(3) When replacing the A/C head only,remove 3 screws (B), use care not to misplace the 3 springs.

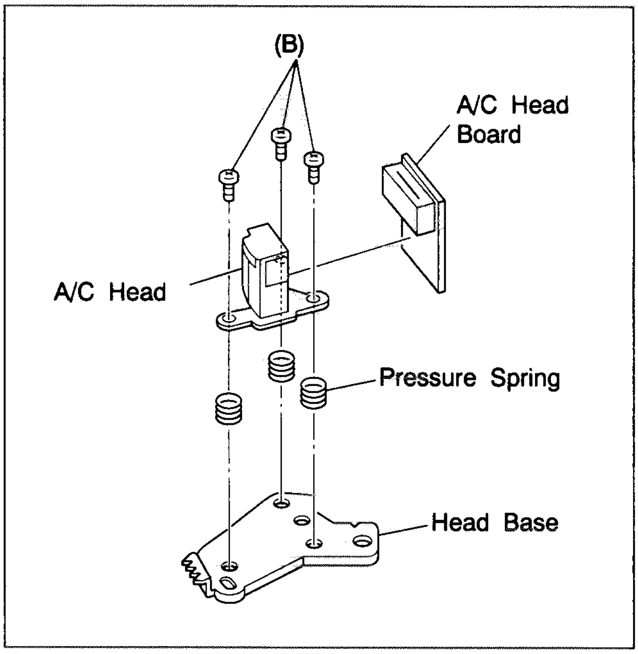


Fig.2-5-3

2. Installation

(1) Temporarily set A/C head height as indicated in Fig. 2-5-4.

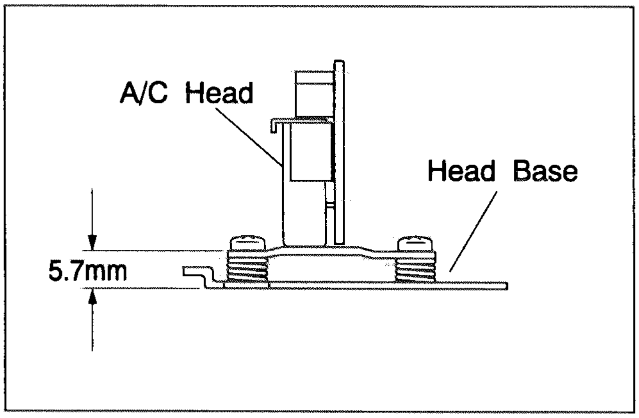


Fig.2-5-4

NOTES:

- *It is very important to correctly adjust the control pulse and audio signal in addition to the mechanical tape path.*
- *Perform interchangeability adjustments after electrical adjustments.*

2.5.3 Pinch Plate

1. Removal

(1) Disengage 2 claws, then remove the pinch plate.

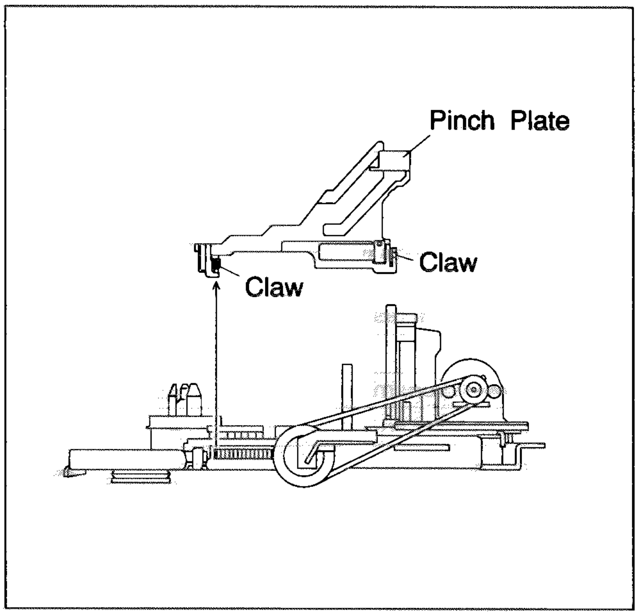


Fig.2-5-5

2. Installation

(1) When installing pinch plate,align rack of pinch plate and triangle mark of control cam as indicated in Fig.2-5-6.

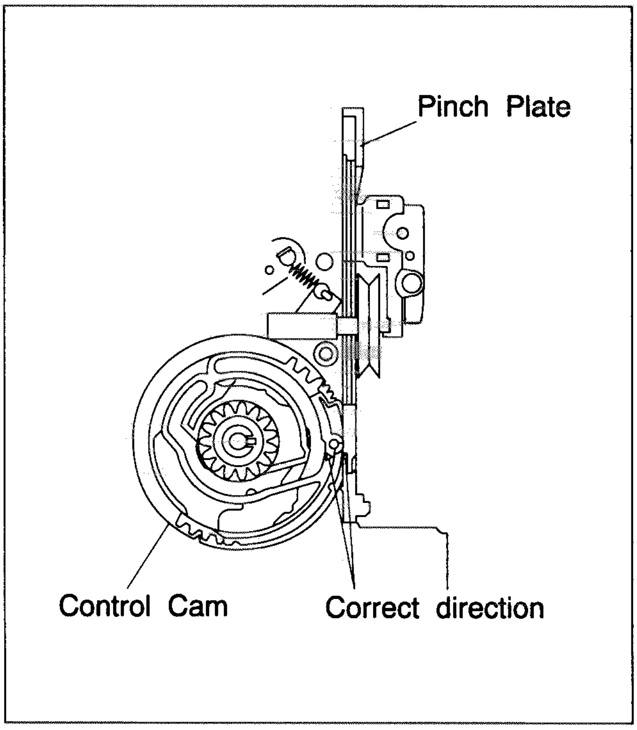


Fig. 2-5-6

2.5.4 Mode Motor

(1) Disengage the belt between mode motor and worm gear.
(2) Take out 2 screws (A) then remove the mode motor.

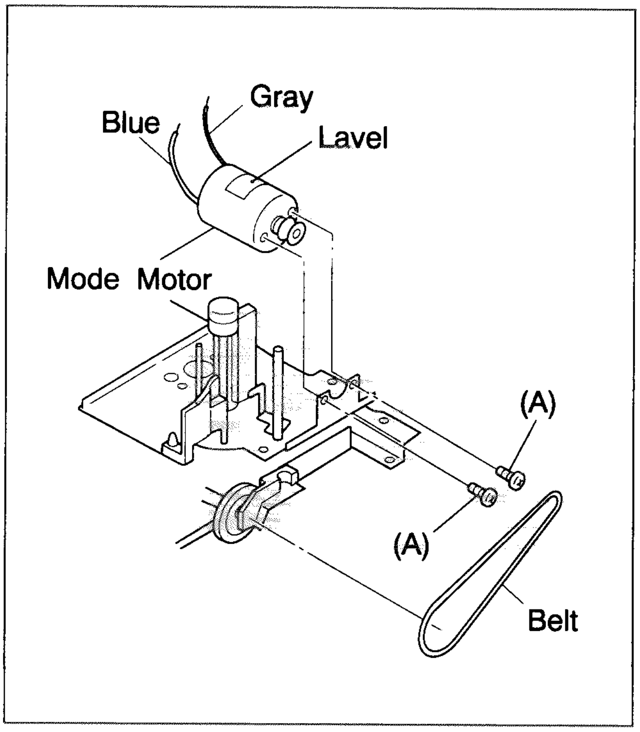


Fig.2-5-7

2.5.5 Lever Assy,Sub Deck Assy,Capstan Motor

(1) Take out 1 slit washer,then remove the lever assy.
(2) Disengage the belt(capstan motor) from bottom of mechanism assy first as indicated in Fig.2-5-10.
(3) Take out 3 screws (A) and remove the sub deck assy as indicated in Fig.2-5-8.
(4) Take out 3 screws (B) and remove the capstan motor from the sub deck assy as indicated in Fig.2-5-9.

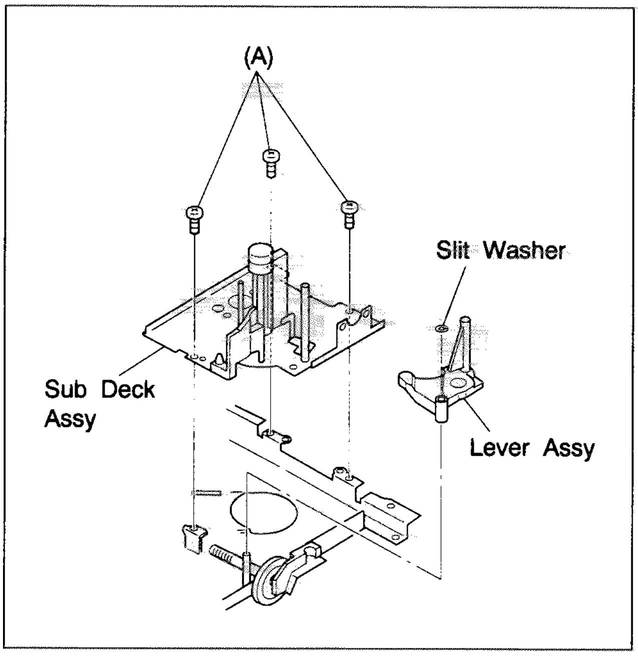


Fig.2-5-8

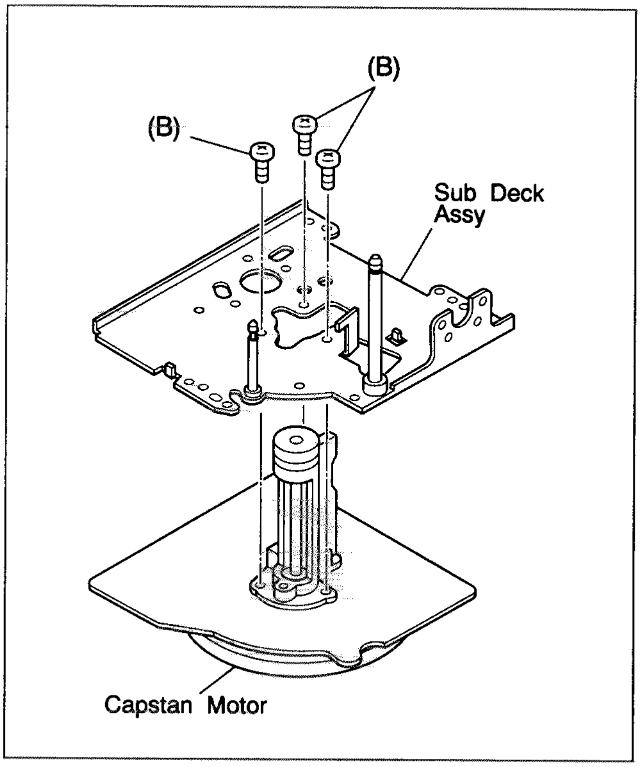


Fig.2-5-9

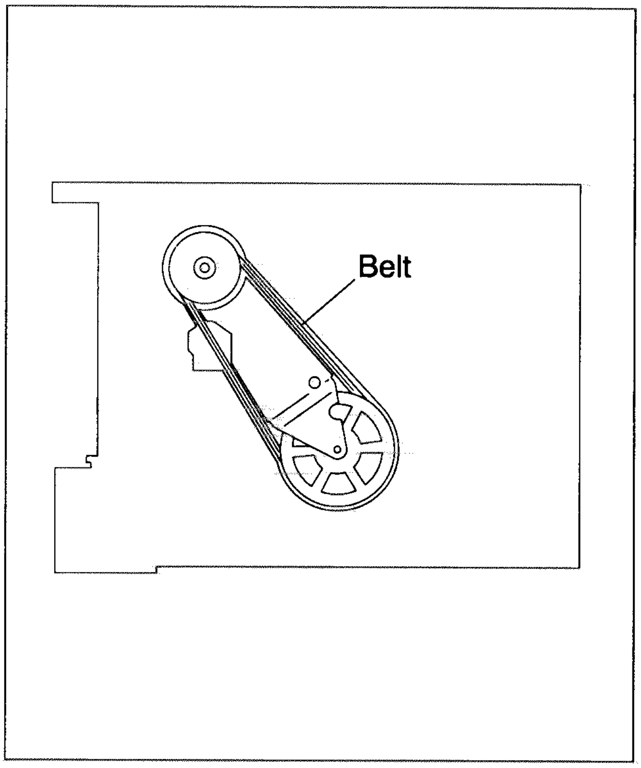


Fig.2-5-10

2.5.6 Control Bracket-1,Earth Pllate

(1) Take out 1 screw (A) and 1 screw (B).
(2) Remove the control bracket-1 and earth pllate.

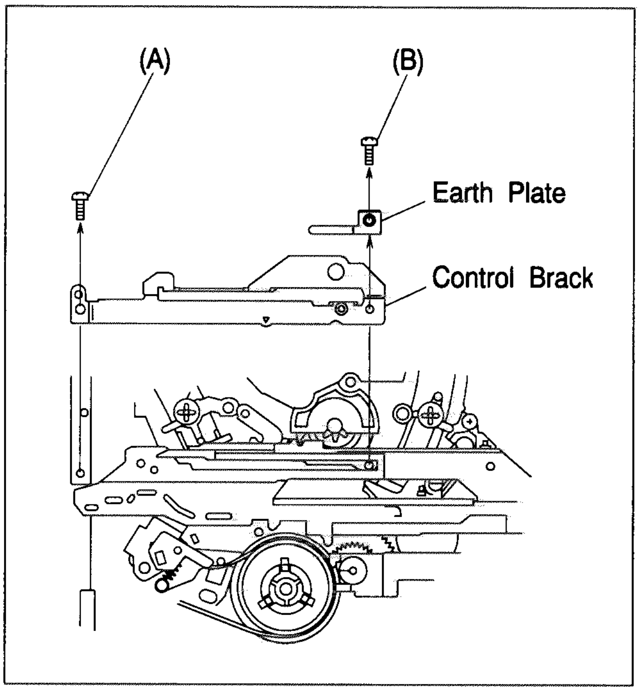


Fig.2-5-11

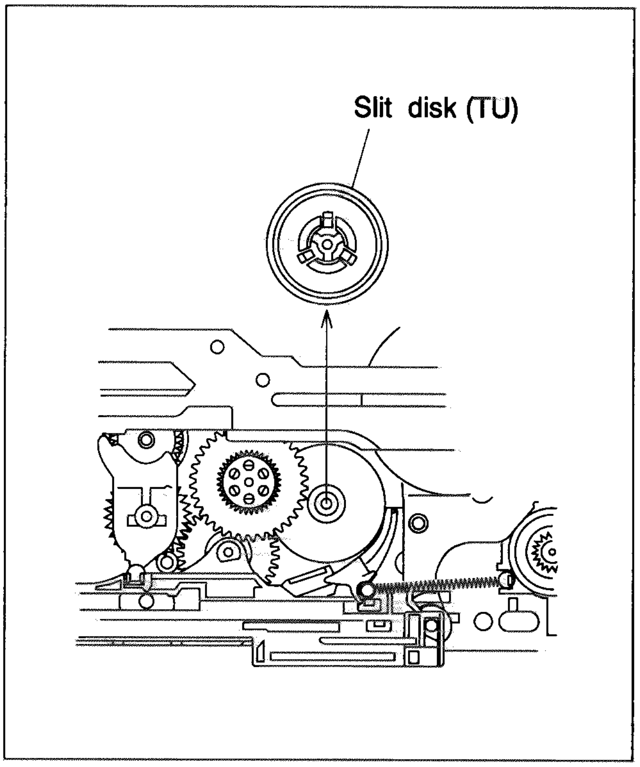


Fig.2-5-13

2.5.7 Reel Bracket,Slit disk (take-up)

(1) Take out 2 slit washers.
(2) Remove the reel bracket and slit disk(take-up).

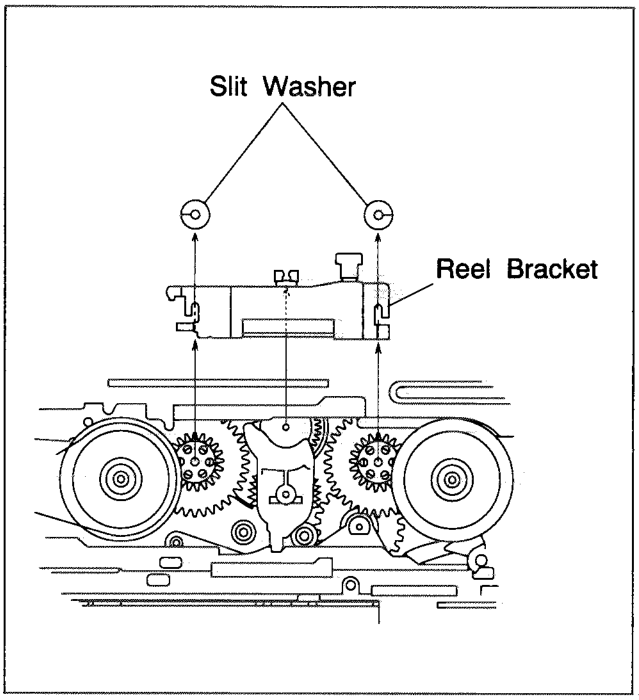


Fig.2-5-12

2.5.8 Control Bracket-2,Control Plate

(1) Take out 1 screw (A) and remove the control bracket-2.
(2) Take out 1 slit washer.
(3) Disengage 2 claws and remove the control plate.

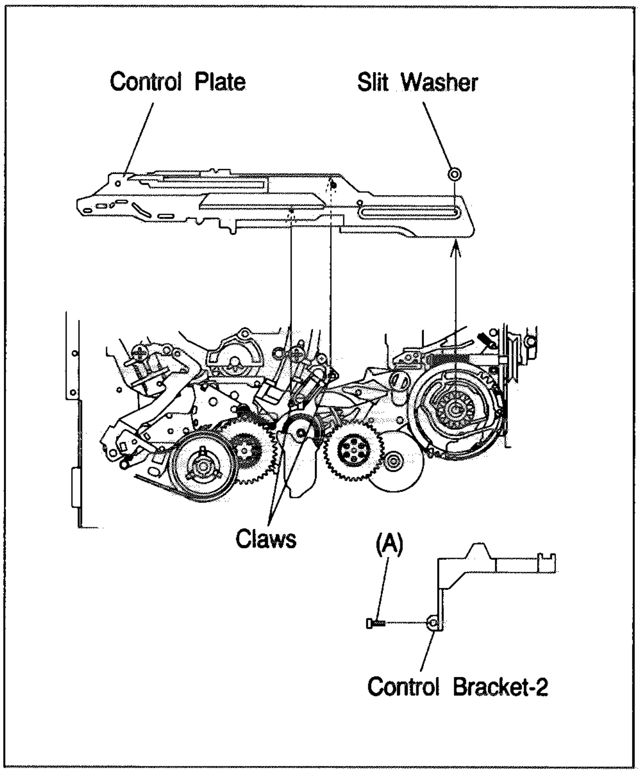


Fig.2-5-14

2.5.9 Sub Brake(take-up),Control Cam

(1) Disengage 1 spring (a) and 1 claw then remove the sub brake (take-up).

(2) Disengage 1 claw and remove the control cam.

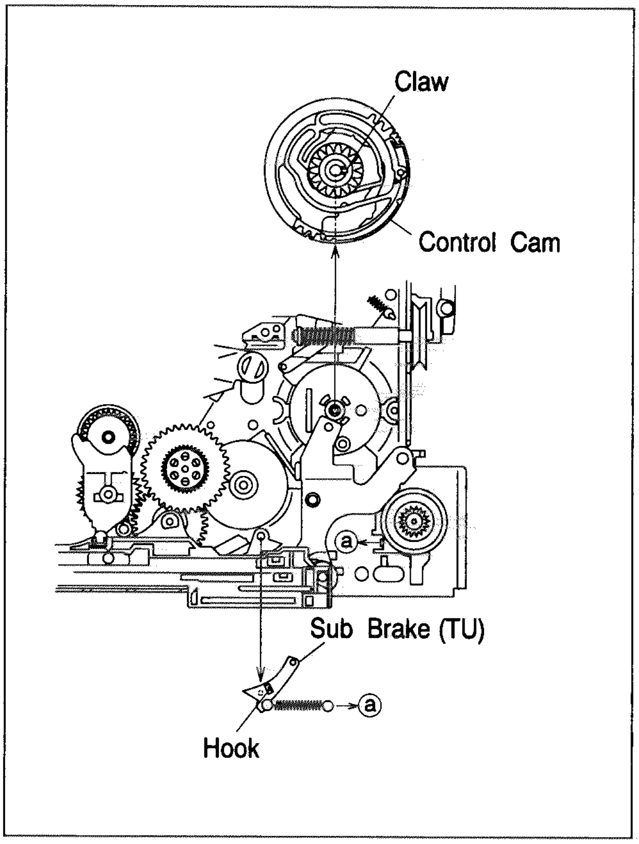


Fig.2-5-15

2.5.10 Slide Plate

(1) Disengage 7 claws from bottom of the mechanism assy and remove the slide plate.

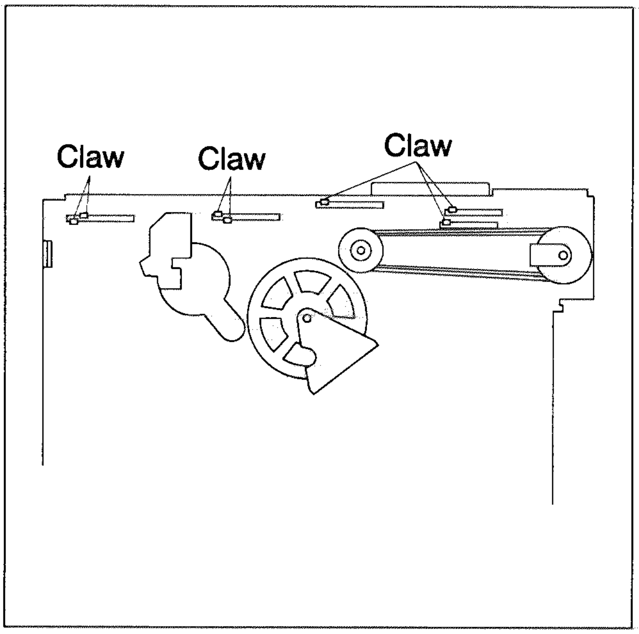


Fig. 2-5-16

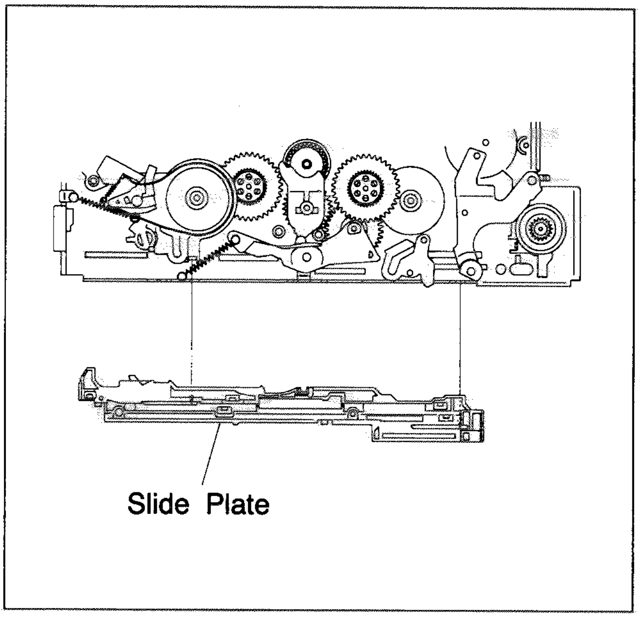


Fig. 2-5-17

2.5.11 Change Lever,Rotary Encoder

(1) Remove the change lever.

(2) Disengage 2 claws and remove the rotary encoder.

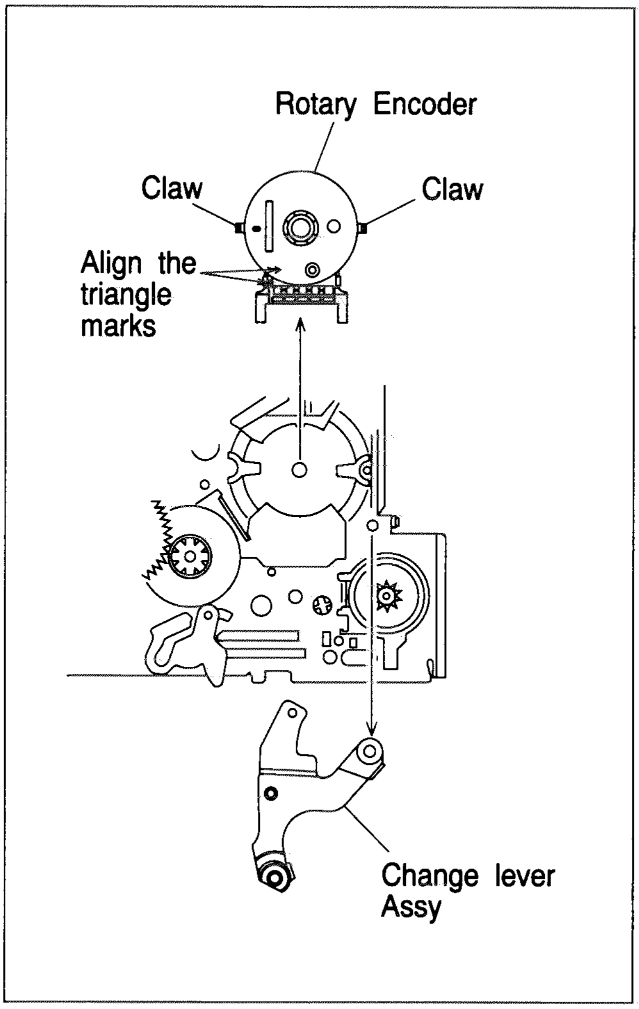


Fig. 2-5-18

2.5.12 Sub Brake (supply),Tension Band Assy,Tension Arm Assy,Take-up Lever Assy,Slit Disk(supply)

(1) Disengage 1 spring (a).
(2) Disengage 1 claw and remove the sub brake (supply).
(3) Take out 1 screw (A),spring (c) and slit washer.
(4) Remove the tension arm assy with tension band assy.
(5) Disengage 1 spring (b) and remove the take-up lever assy.
(6) Remove the slit disk(supply).

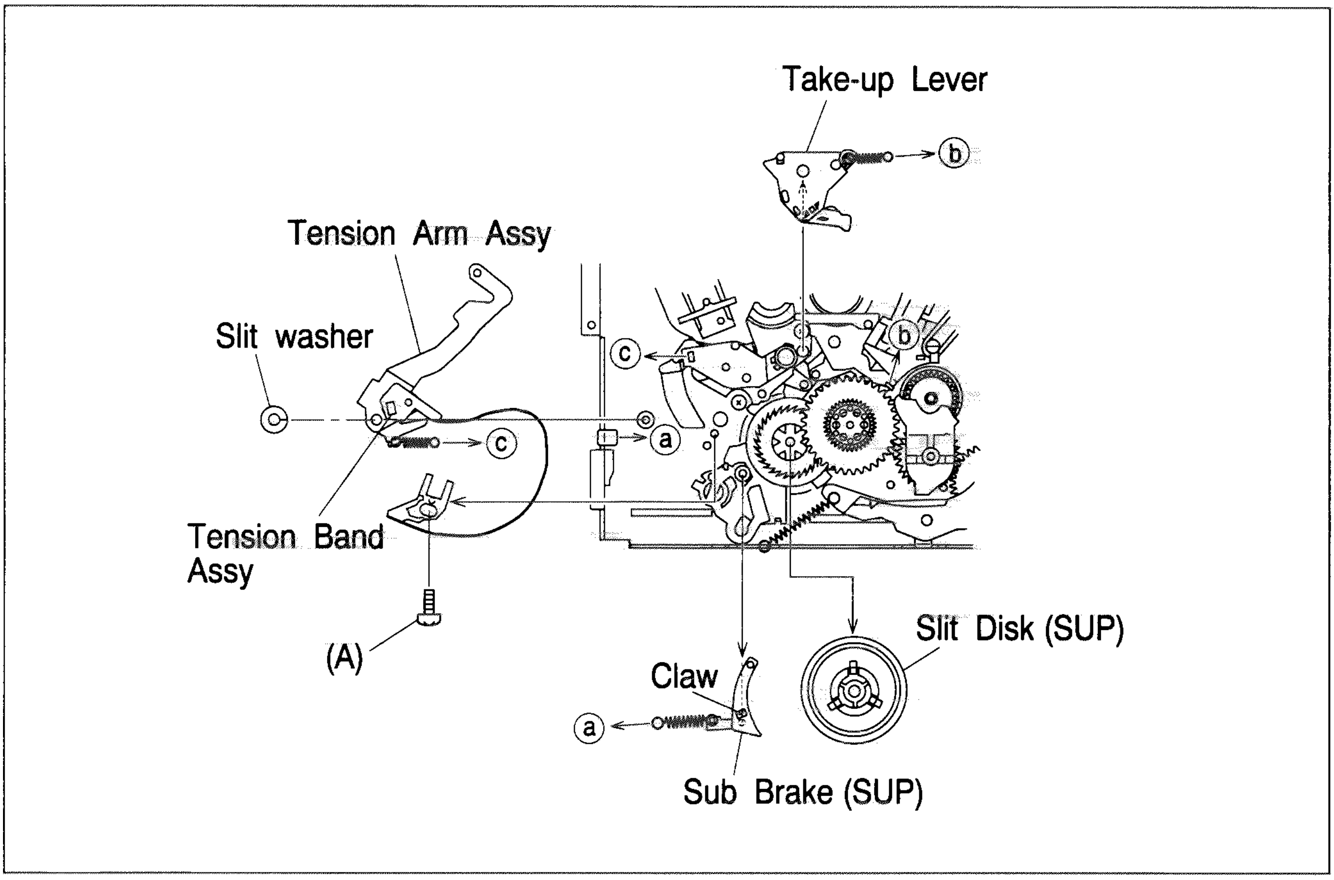


Fig. 2-5-19

2.5.13 Take-up Head,Tension Arm Lever

(1) Remove the take-up head and tension arm lever.

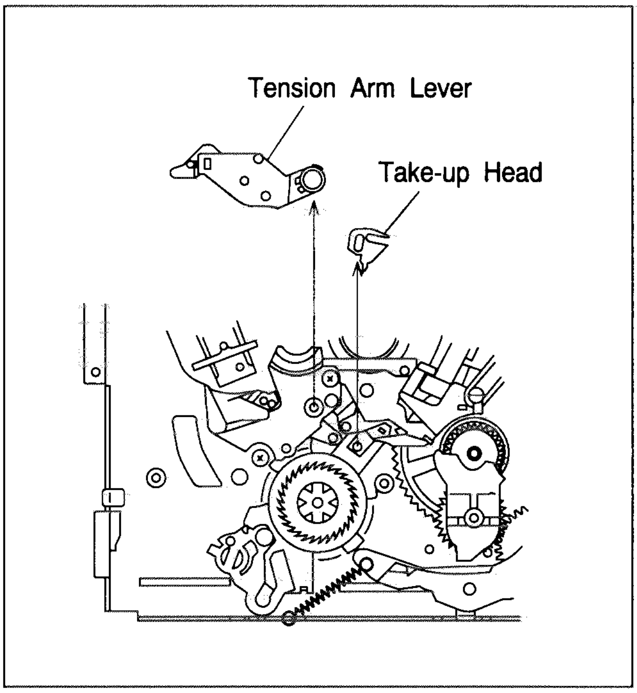


Fig.2-5-20

2.5.14 Guide Rail

(1) Take out 5 screws (A) and 1 screw (B).

(2) Disengage 4 claws and remove the guide rail.

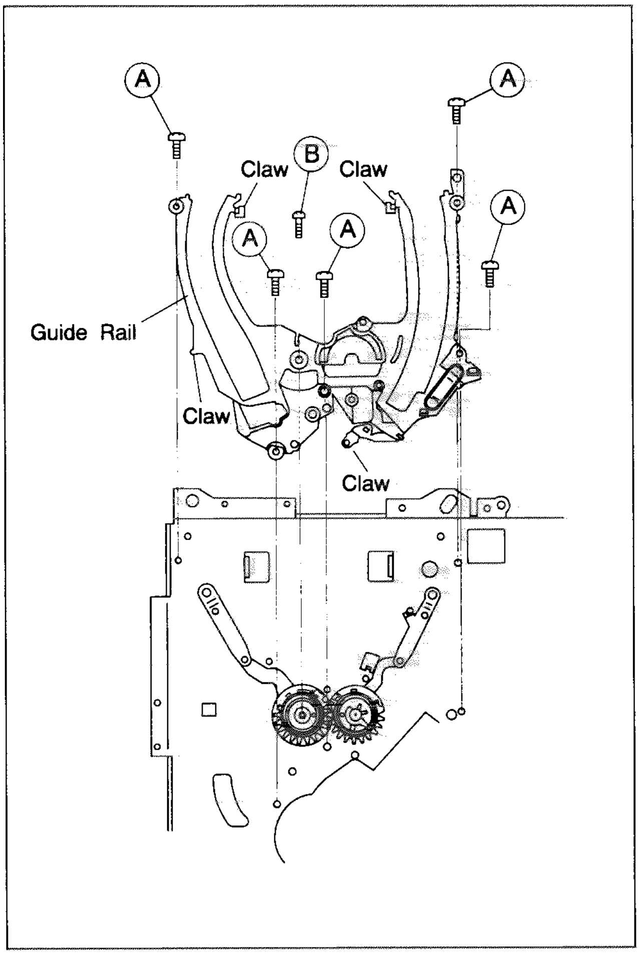


Fig. 2-5-21

2.5.15 Stator Assy

(1) Take out 2 screws (A).

(2) Raise the stator assy in the direction indicated by the arrow to remove it (also remove the inertia roller).

(3) Remove the flat cable.

(4) To reinstall,first secure the flat cable,then insert 2 screws (A).

(5) After reinstalling, be sure to perform PB switching point adjustment(See SECTION 3 ELECTRICAL ADJUSTMENT).

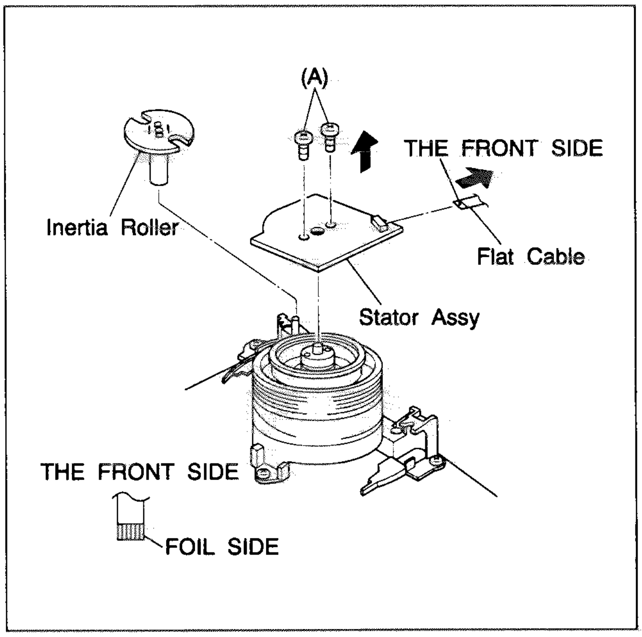


Fig. 2-5-22

NOTE : *When refitting the connector, check that the flat wire is inserted correctly.*

2.5.16 Rotor Assy

(1) Remove the stator assy.

(2) Take out 2 screws (B) and remove the rotor assy.

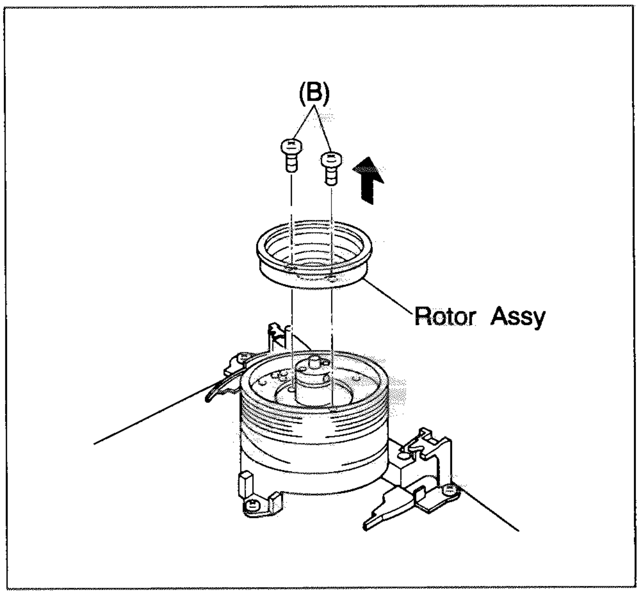


Fig.2-5-23

(3) Align the upper dum assy and rotor assy phase as indicated in Fig.2-5-22.

(4) Overlap holes (a) of the upper drum assy with holes (b) of the rotor assy (align holes in 3 locations) and secure with 2 screws (B) as indicated in Fig.2-5-21.

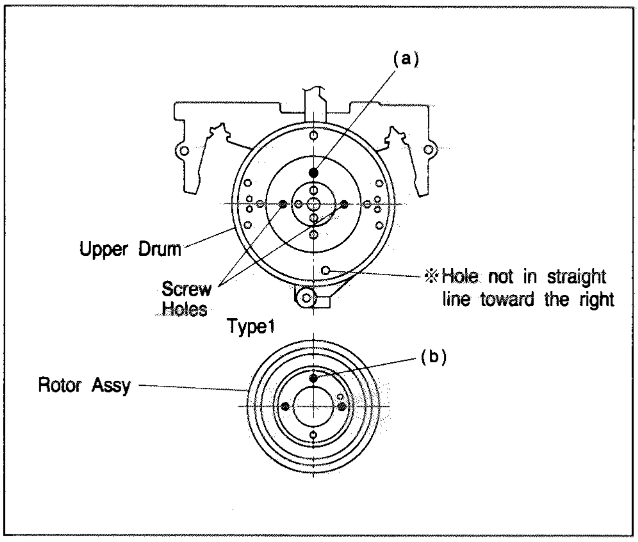


Fig. 2-5-24

2.5.17 Upper Drum Assy

1. Removal

(1) Remove the stator assy and rotor assy.

(2) Use a 1.5 mm hexagonal wrench to loosen the collar assy screw and remove the collar assy.

(3) Remove the upper drum assy and use tweezers to remove the Washer.

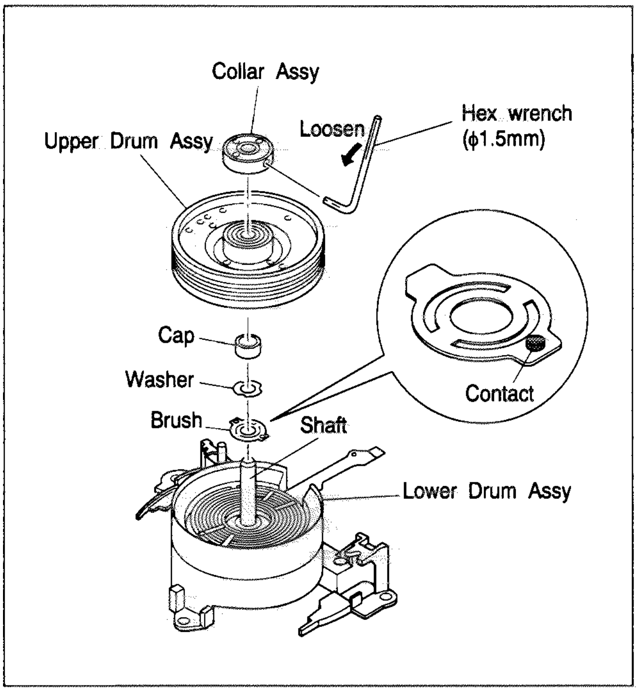


Fig. 2-5-25

NOTE : *If the Brush is replaced, do not apply the grease to the contacts.*

2. Installation

(1) Use an air brush to clean the lower drum assy and the coil section of the new upper drum assy.

(2) Set a new washer on the drum shaft as indicated in Fig.2-5-25.

NOTE : *Be sure to use the new washer when replace the upper drum assy.*

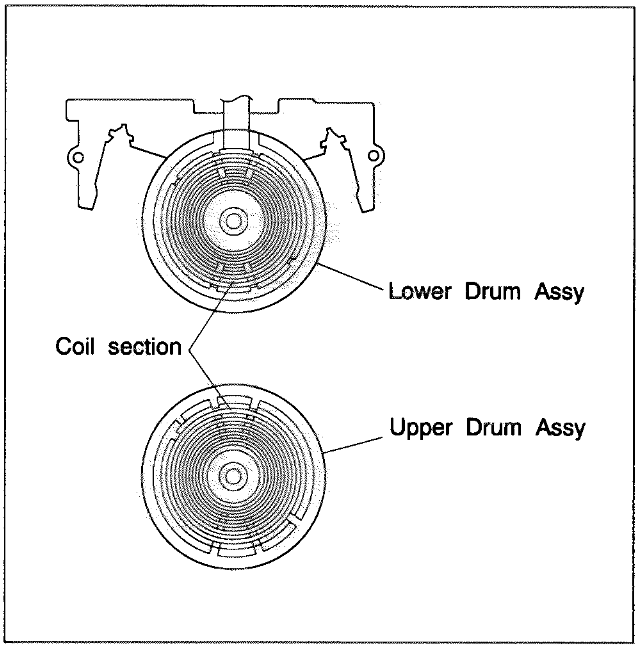


Fig.2-5-26

(3) Note the top and bottom of the collar assy and determine the position as indicated in Fig.2-5-25.

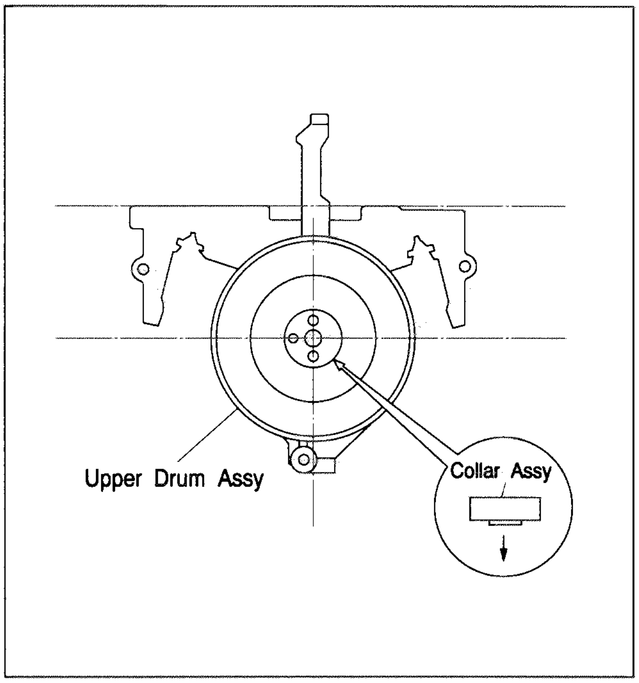


Fig.2-5-27

(4) While pressing the collar assy evently from above with your fingertips,secure the hexagonal screw.

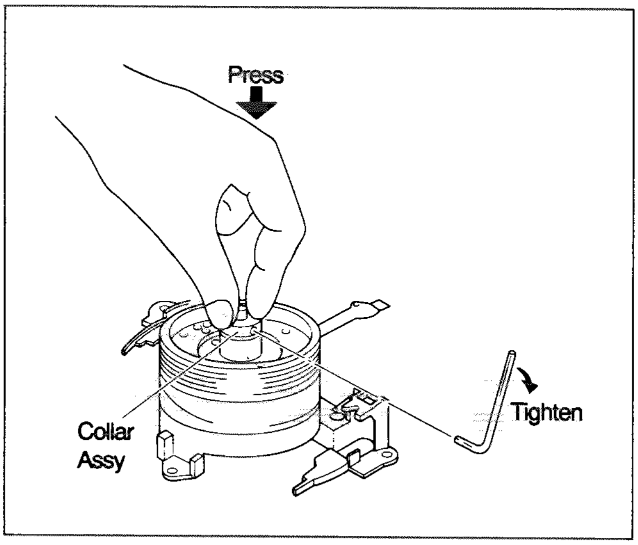


Fig.2-5-28

(5) After installing,gently turn the upper drum by hand and confirm normal rotation.
(6) Install the rotar assy and stator assy.
(7) Clean the upper and lower drum assies and perform the following adjustments;
- PB switching point adjustment
- Slow tracking preset adjustment
- Interchangeability adjustment (be sure to check LP mode)

2.6 CHECKUP AND ADJUSTMENT OF MECHANISM PHASE

2.6.1 Precaution

The rotary encoder and syscon circuit are closely interrelated.Therefore,the rotary encoder and control cam conection determines the operations of mechanical parts such as plates,gears,brakes,etc.Correct positioning of these parts is essential for smooth tape loading and mechanical operations.

2.6.2 Loadidg Arm Assy (supply,take-up)

(1) Install the supply loading arm assy and the take-up loading arm assy so that their positioning markings on the respective gear face each other and the holes of their arms correspond to the holes on the main deck assy respectively.
(2) After setting the guide rails,engage the pole base assies with the tip of the loading arms respectively. Then,enter the mechanism into the unloading mode to return the pole base assies to the front position.
(3) Reassemble the peripheral parts of the guide rail as originally.

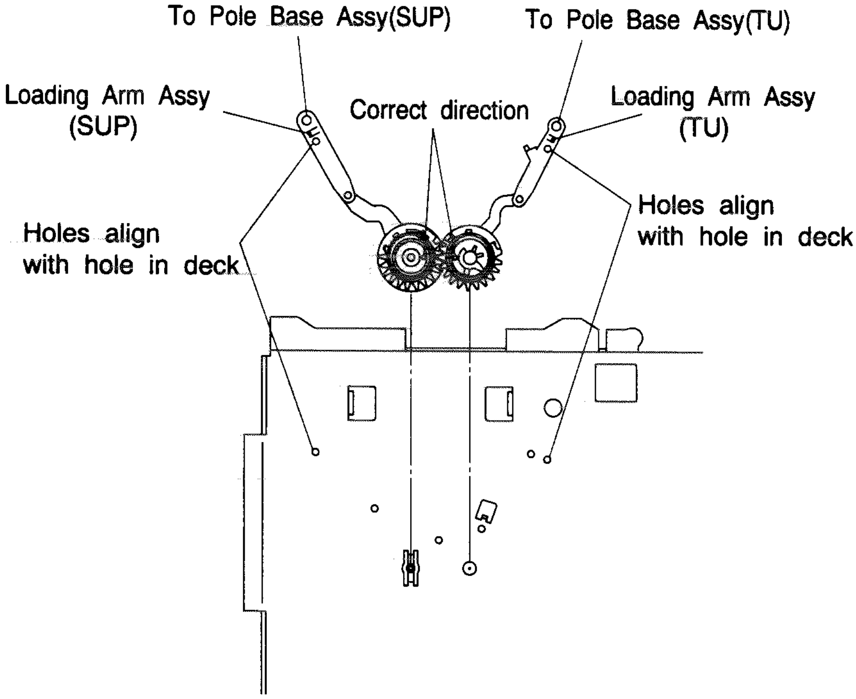


Fig. 2-6-1

2.6.3 Rotary Encoder,Change Lever,Control Cam

(1) When reinstalling the rotary encoder,adjust its position so as to fit the triangle marks each other and push it deep untill it is locked by the pawls.

(2) When reinstalling the change lever,set it so as to make its positioning hole correspond to the hole of the main deck assy.

(3) When re-engaging the control cam,lower the capstan brake assy while setting it so as to make its positioning hole correspond to the hole of the main deck assy.

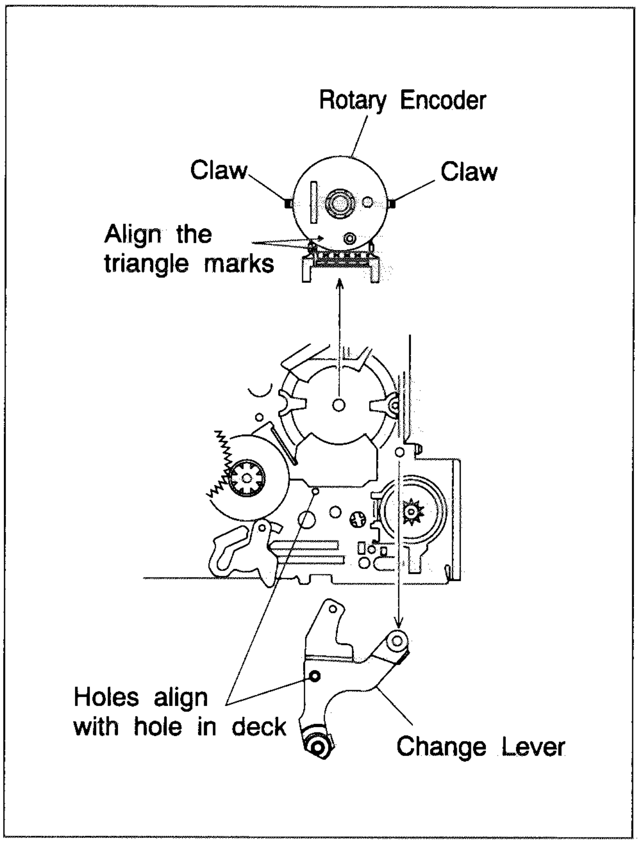


Fig. 2-6-2

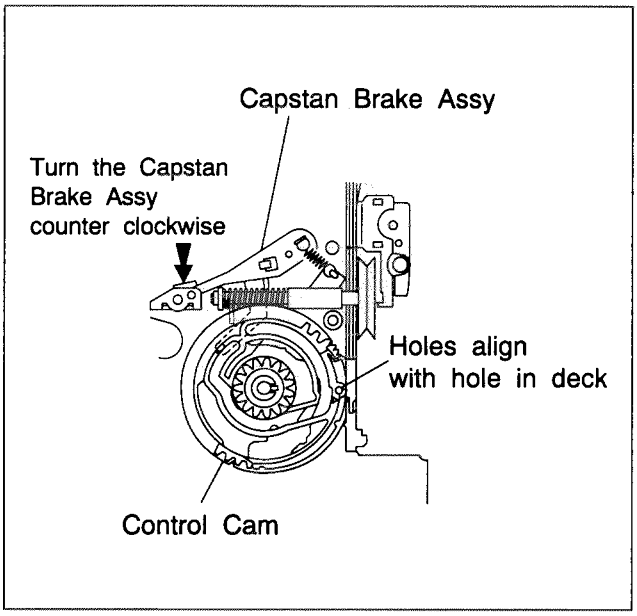

Capstan Brake Assy
Turn the Capstan Brake Assy counter clockwise
Holes align with hole in deck
Control Cam

Fig. 2-6-3

2.6.4 Slide Plate

(1) Lower both the main brake assies (supply and take-up) untill they touch the edge of the main deck assy while reinstalling the slide plate so as to make the respective positioning holes of the main brake assies correspond to the holes on the main deck assy.

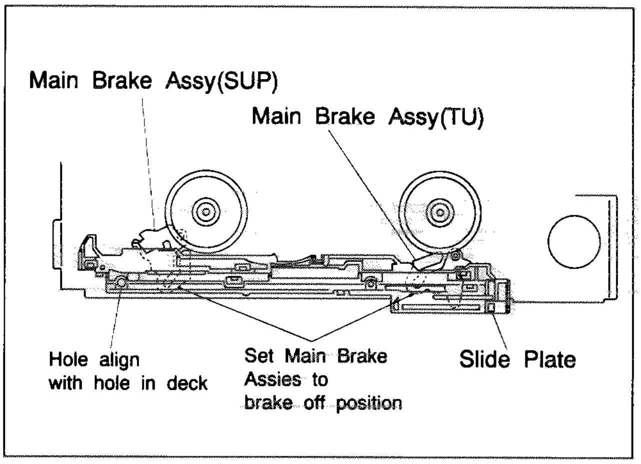

Main Brake Assy(SUP)
Main Brake Assy(TU)
Hole align with hole in deck
Set Main Brake Assies to brake off position
Slide Plate

Fig.2-6-4

2.6.5 Control Plate

(1) Reinstall the control plate so as to set the two positioning holes of it on the holes on the main deck assy respectively and to set the positioning hole of the take-up lever on the hole of the main deck at the same time. When adjusting the hole position of the take-up lever,use a pair of tweezers to hold and move it since it is pulled by a tension spring.

(2) After reinstalling the control plate,fix it with the slit washer,control bracket-1 and -2.

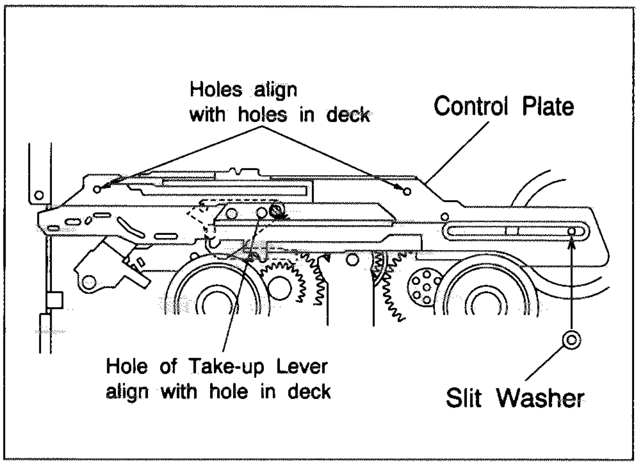

Holes align with holes in deck
Control Plate
Hole of Take-up Lever align with hole in deck
Slit Washer

Fig. 2-6-5

2.7 TAPE INTERCHANGEABILITY ADJUSTMENT

NOTE :
- *This adjustment is extremely important. However, it is normally not required during routine service. Perform only after replacing major components(A/C head,upper/lower drum assy,pole base assy,etc).*
- *Before using costly alignment tape,use a spare tape and confirm correct operation of the tape transport.*

2.7.1 Tape pattern

(1) Connect the oscilloscope to TP1(PB -C) on the MAIN board.Use TP2(SW.P) on the PRE/REC board as a trigger.

(2) Playback the SP stairstep portion of the alignment tape [MHPE].Confirm that the FM waveform appears as indicated in Fig.2-7-1.

(3) Set the manual tracking position by pressing the AUTO button on the remote controller.

(4) Operate the tracking adjustment (press the TRACKING buttons during playback) and set for maximum playback FM waveform.

(5) By operating the TRACKING button,vary the FMwaveform from maximum to minimum and vice versa to confirm that the waveform varies nearly in a flat shape as shown in Fig.2-7-1.

(6) When the FM waveform does not remain flat during this process,first slightly loosen the set screw located at the bottom of the guide rollers.Using the guide roller adjustment tool (Roller driver) ,adjust the supply and take-up guide rollers (refer to Fig.2-7-2) to obtain the correct waveform as indicated in Fig.2-7-3.

(7) By pressing the TRACKING buttons several times,vary the FM waveform output from maximum to minimum (and vice versa) gradually,and confirm that the variation proceeds in flat shape, as shown in Fig.2-7-3.

(8) Next playback the LP stairstep portion of the alignment tape [MHPE-L] and adjust the tracking control from maximum to minimum the FM waveform,confirm that FM waveform variation is always flat.

(9) Record the signal and play it back in both of the SP and LP mode,confirm that the FM waveform is flat in both mode.

(10) After adjustments,tighten the set screw of the guide rollers.

(11) Confirm that the tape wrinking does not occur at the roller upper or lower limits as indicated in Fig.2-7-4.

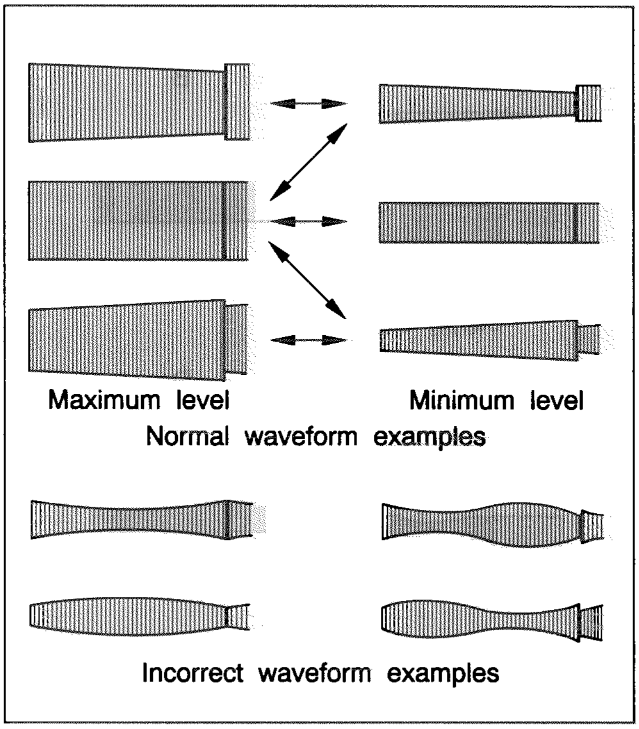


Fig. 2-7-1

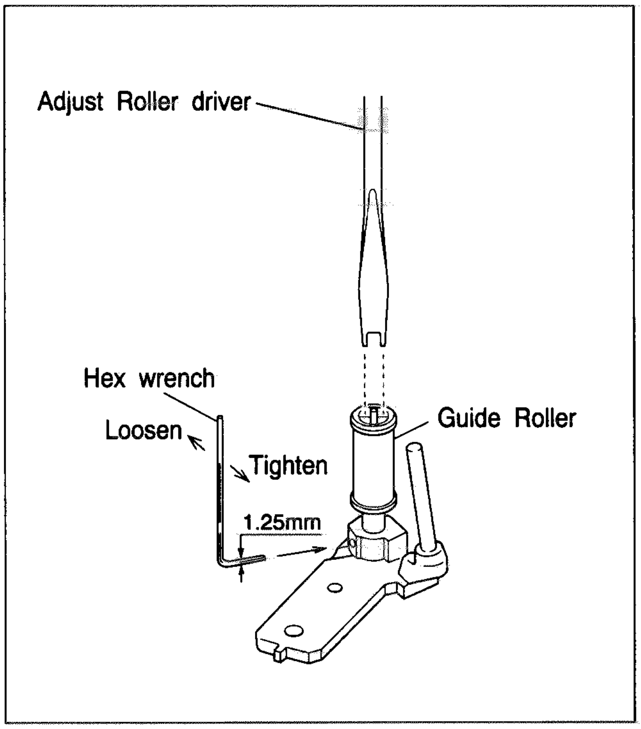


Fig. 2-7-2

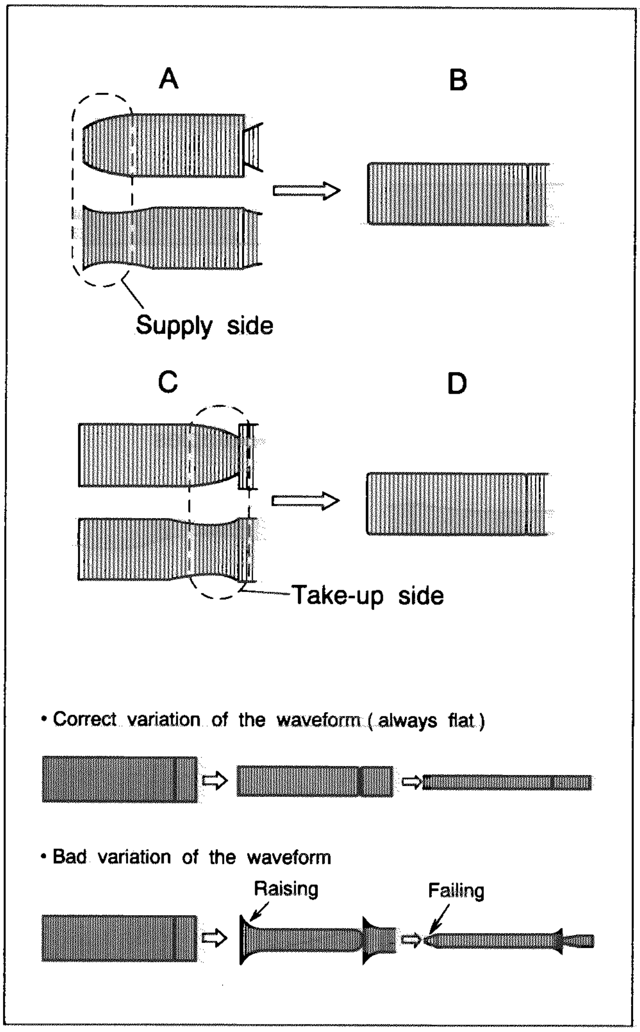

A
B
Supply side
C
D
Take-up side
• Correct variation of the waveform (always flat)
• Bad variation of the waveform
Raising
Failing

Fig. 2-7-3

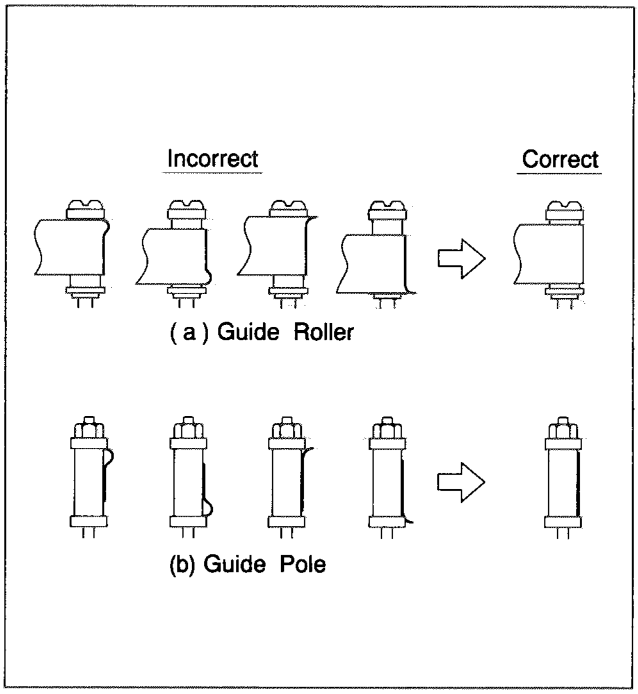


Fig. 2-7-4

2.7.2 A/C head height & azimuth

NOTE :
- *Temporarily set A/C head height as indicated in Fig. 2-5-4.*
- *Use spare tape to check the transport and confirm the tape is not scratched or damaged.*

1. Tilt

(1) Use spare tape and set for playback.
(2) Turn screw (3) clockwise to where the tape curls just slightly at the TU guide pole bottom flange as shown in Fig.2-7-5.
(3) Then slowly turn screw (3) counterclockwise to where the curling ceases.

2. Height

(1) Connect CH-1 of a dual trace oscilloscope to TP301(A.OUT).
(2) Connect CH-2 to TP501(CTL) of the Main board assy and use the ALT mode.
(3) Playback the SP stairstep portion of the alignment tape [MHPE].
(4) Adjust screws (1),(2) and (3) for maximum audio output and control pulse level.

3. Azimuth

(1) Connect the oscilloscope to TP301(A.OUT).
(2) Playback the SP stairstep portion of the alignment tape [MHPE].
(3) Adjust screw (2) so that the audio output is both maximum and with minimum fluctuation.

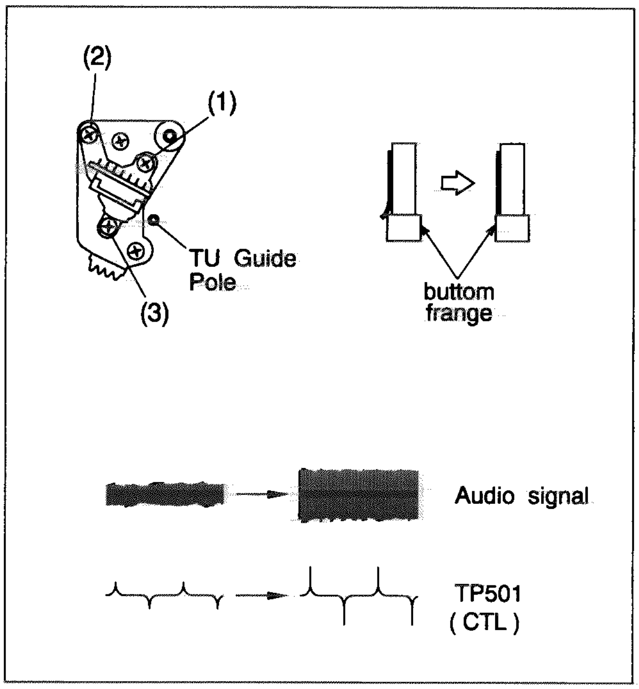


Fig. 2-7-5

2.7.3 A/C head phase(X-value)

(1) Connect the oscilloscope to TP1(PB-C) on the MAIN board. Use TP2(SWP) on the MAIN board as a trigger.

(2) Playback the SP stairstep portion of the alignment tape [MHPE].

(3) Set the neutral manual tracking position by pressing the AUTO button on the remote controller.

(4) If adjustment is required,slightly loosen screws (4) and (5). Set A/C head positioning tool on the A/C head adjusting boss as indicated in Fig.2-7-6.

(5) Turn the tool first to position the A/C head fully toward the capstan. Then gradually return it toward the drum and stop at the position of maximum FM waveform output level as shown in Fig.2-7-7.

(6) Tighten screw (5). Remove the tool and tighten screw (4).

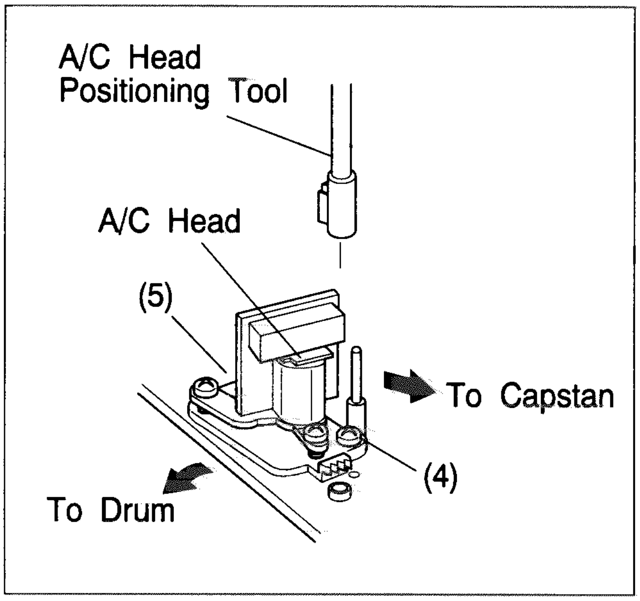


Fig. 2-7-6

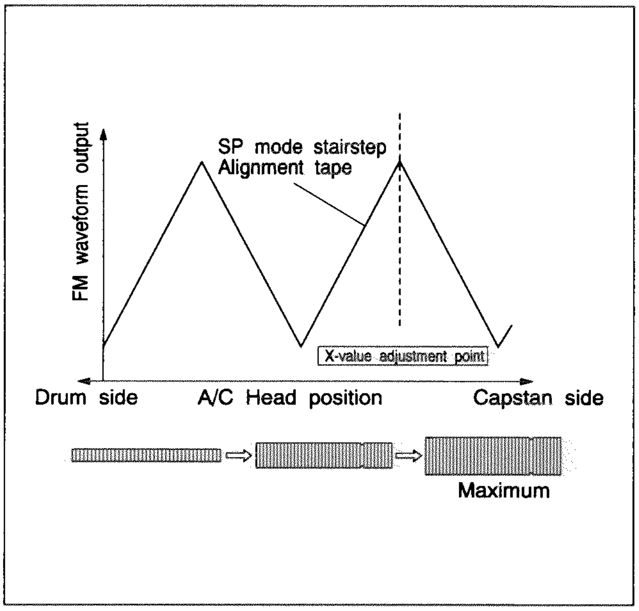


Fig. 2-7-7

2.7.4 Tension pole position

(1) Set for playback mode using MECHANISM SERVICE MODE(See SECTION 1 DISASSEMBLY).

(2) Slightly loosen the screw (A) .

(3) Turn the adjust pin so that the tension arm assy does not touch ϕ2.5 pole on the outside.

(4) Tighten the screw (A).

(5) After adjustment,use the back tension cassette gauge and set for the playback mode.

(6) Confirm reading of 35 to 48 g•cm.

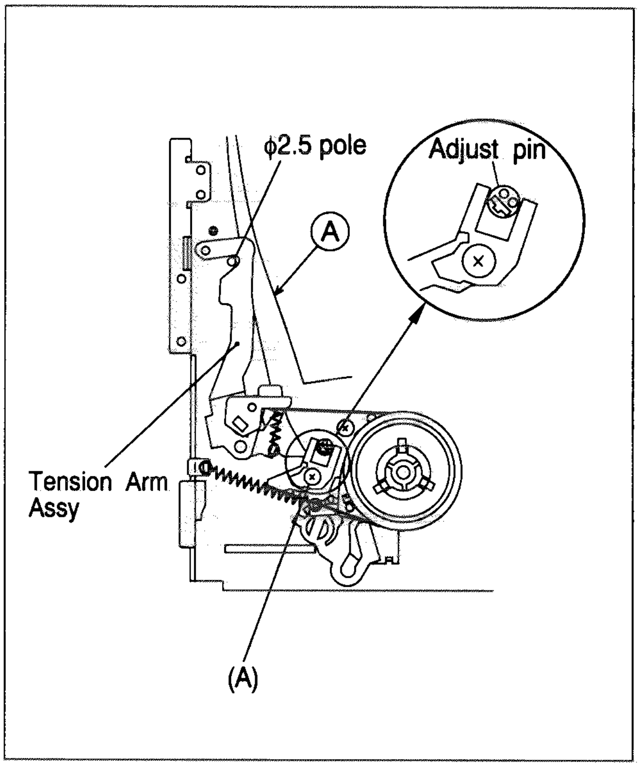


Fig. 2-7-8

2.7.5 Take-up torque

(1) Use the back tension cassette gauge and set for the playback mode.

(2) Confirm reading of 60 to 100 g•cm.

SECTION 3
ELECTRICAL ADJUSTMENT

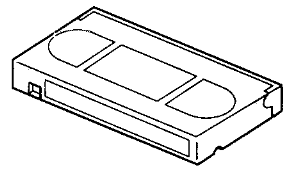
3.1 PRECAUTION

Electrical adjustment are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also do not attempt these adjustments unless the proper equipments is availagle.

3.1.1 Required test equipment

① Colour television or monitor
② Oscilloscope: wide-band,dual-trace,triggered delayed sweep
③ Frequency counter
④ Digital voltmeter
⑤ Signal generator: RF/IF sweep/maker
⑥ Signal generator: PAL colour bar, stairstep
⑦ Recording tape
⑧ Remote controller(provided)

3.1.2 Required adjustment tools

Alignment tape (SP,stairstep) MHPE


3.1.3 Colour bar signal,colour bar pattern

- Colour bar signal

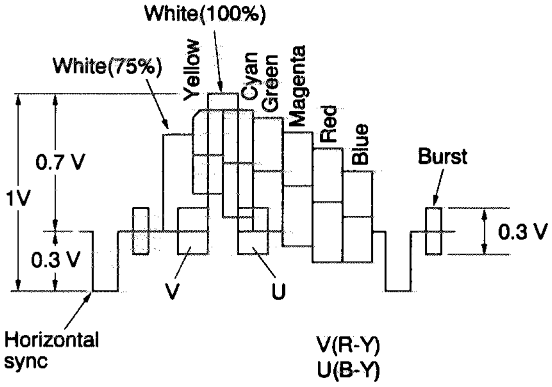


Fig.3-1-1 Colour bar signal waveform

- Colour bar pattern

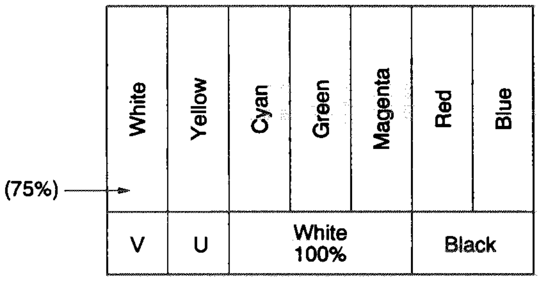


Fig.3-1-2 Colour bar pattern

3.2 SERVO CIRCUIT

Note: • *Unless otherwise specified, all measurement point and adjustment parts are located on the MAIN BOARD.*

3.2.1. PB switching point

Signal	• Alignment tape [MHPE],Stairstep
Mode	• PB,Automatic tracking OFF
Equipment	• Oscilloscope
Measurement point	•TP101(V.OUT)
Trigger slope (–)	• TP2(SWP)
Adjustment Part	• VR501(SW.P)
Specification	• 6.5 ± 0.3H

(1) Connect an oscilloscope to TP101 and external trigger from TP2 (negative slope).
(2) Playback the stairstep signal of the alignment tape.
(3) Set the tracking control to the centre position by pressing the "AUTO" button on the remote controller.
(4) Adjust VR501 to position the tirgger point 6.5±0.3H from V.sync.

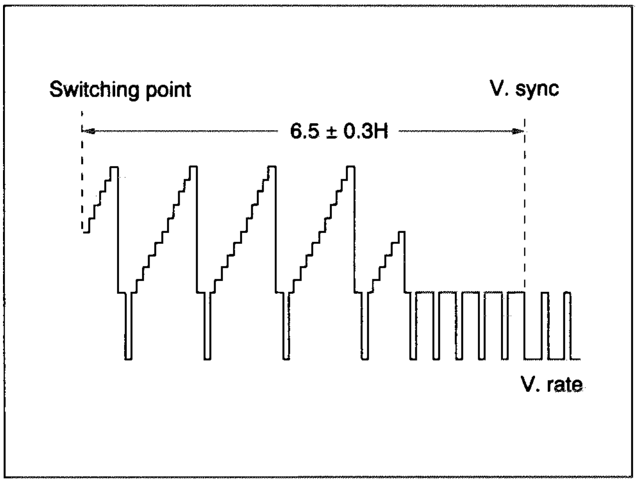


Fig.3-2-1 PB switching point

3.3 AUDIO CIRCUIT

Note: *Unless otherwise specified, all measurement points and adjustment parts are located on the MAIN BOARD.*

1. BIAS (HR-P60K,HR-P70K only)

Signal	• No signal
Mode	• REC • SP • AUX
Equipment	• Millivoltmeter
Measurement point	•TP302 (BIAS +) •TP303 (BIAS –)
Adjustment Part	• VR301(BIAS)
Specification	• 2.60 ± 0.05 mVrms

(1) Connect an millivoltmeter between TP302 and TP303.
(2) Set for REC mode.
(3) Adjust VR301 for 2.60 ± 0.05 mVrms.

SECTION 4
CHARTS AND DIAGRAMS

SCHEMATIC DIAGRAM NOTES

Safety precautions
The Components identified by the symbol ⚠ are critical for safety. For continued safety, replace safety critical components only with manufactures recommended parts.

1. Schematic diagram values

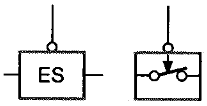
Unless otherwise specified.

1) All resistance values are in ohms. 1/6 W, 1/8 W (refer to parts list).
   Chip resistors are 1/16 W.
   K: KΩ (1000Ω), M: MΩ (1000KΩ)
2) All capacitance values are in μF, (P: PF).
3) All inductance values in μH, (m: mH).
4) All diodes are 1SS133 or MA165, (refer to parts list).

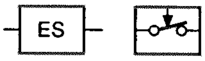
2. Indications

AUX : Active only at high.

$\overline{\text{AUX}}$: Active only at low.

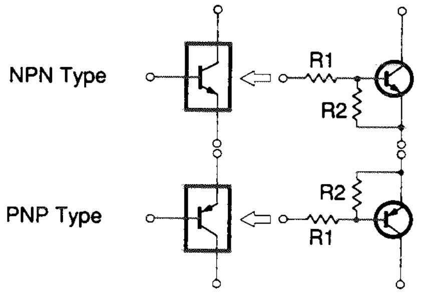


Active only at low for electronic switch.

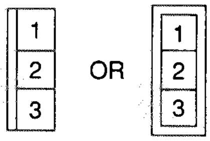


Active only at high for electronic switch.

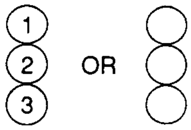
Digital transistor :
The digital transistor includes built in resistors.
It features small size and high reliability.



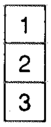
3. Interpreting Connector indications



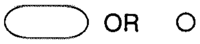
Removable connector



Direct connection on board



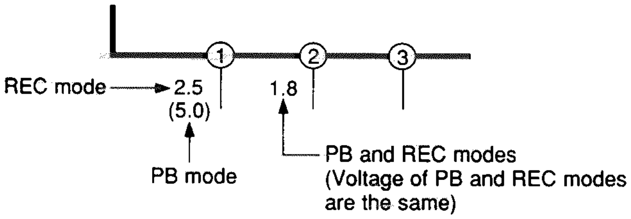
Non-removable Board connector



Connected pattern on board

4. Voltage measurement

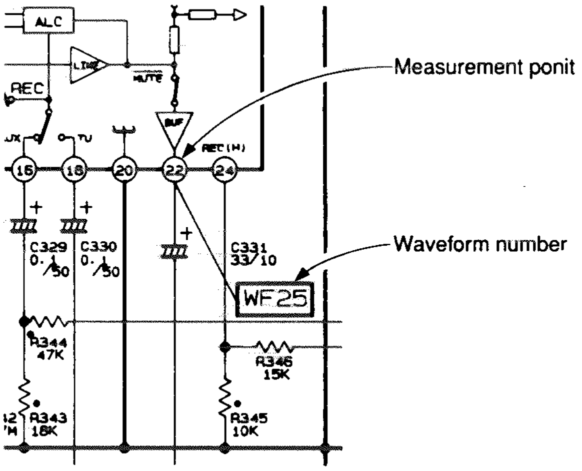
1) Video circuits
   REC: Colour bar signal in SP mode, normal VHS mode.
   PB : Alignment tape, colour bar SP mode, normal VHS mode.
   — : Unmeasurable or unnecessary to measure.
2) Audio circuits
   REC: 1KHz, –8 dBs sine wave signal in SP mode, Normal VHS mode.
   PB : REC then playback it.
3) Movie Camera circuits
   Measured using a correctly illuminated grey scale or colour bar test charts in the E-E mode.
4) Indication on schematic diagram
   Voltage Indications for REC and PB modes on the schematic diagram are as shown below.



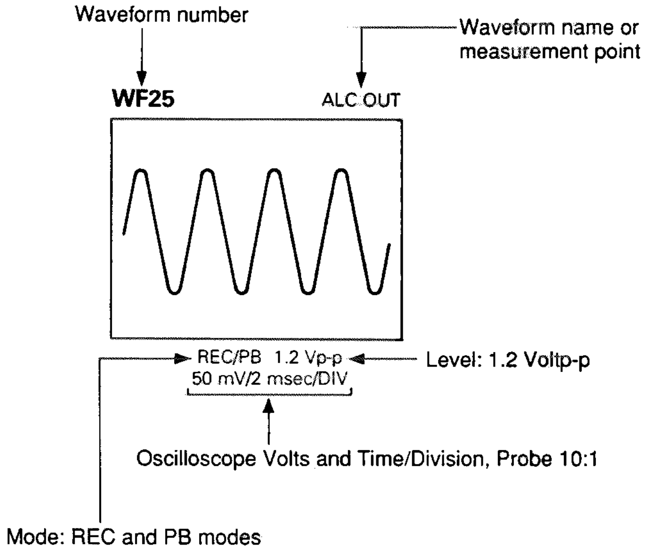
Note: If do not indicate for voltage measurement on the schematic diagram, refer to the voltage charts.

5. Waveform measurement

1) Video circuits
   REC: Colour bar signal in SP mode, normal VHS mode.
   PB : Alignment tape, colour bar SP mode, normal VHS mode.
2) Audio circuits
   REC: 1KHz, –8 dBs sine wave signal in SP mode, normal VHS mode.
   PB : REC then playback it.
3) Movie Camera circuits
   Measured using a correctly illuminated grey scale or colour bar test charts in the E-E mode.
4) Indication on schematic diagram
   Waveform indications on the schematic diagram are as shown below.

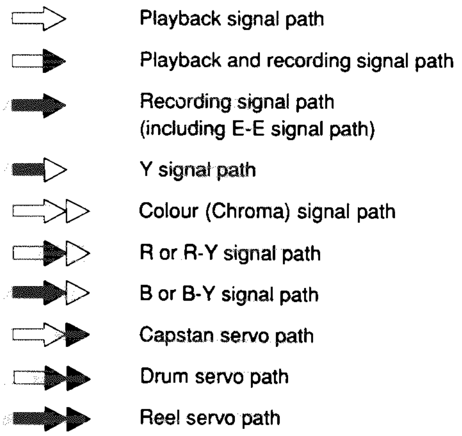


5) Waveform indications



6. Signal path Symbols

The arrows indicate the signal path as follows.



CIRCUIT BOARD NOTES

1. Colour indications

1) Foil side :
   Foil side patterns are indicated at GREY shading.
2) Component side :
   Component side patterns are indicated at RED shading.

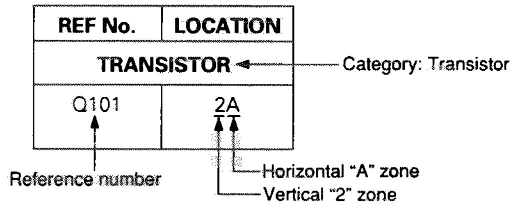
2. Foil and Component sides

1) Foil side (B side) :
   Parts on the foil side seen from foil face (pattern face) are indicated.
2) Component side (A side) :
   Parts on the component side seen from component face (parts face) are indicated.

3. Parts location guides

Parts location are indicated by guide scale on the circuit board.

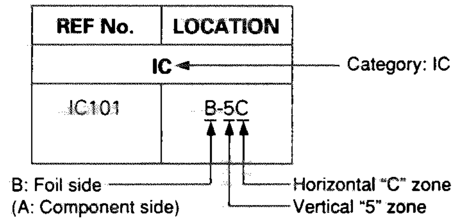
1) Signal pattern :



REF No.	LOCATION
TRANSISTOR	
Q101	2A

Category: Transistor
Reference number
Horizontal "A" zone
Vertical "2" zone

2) Double pattern :



REF No.	LOCATION
IC	
IC101	B-5C

Category: IC
B: Foil side
(A: Component side)
Horizontal "C" zone
Vertical "5" zone

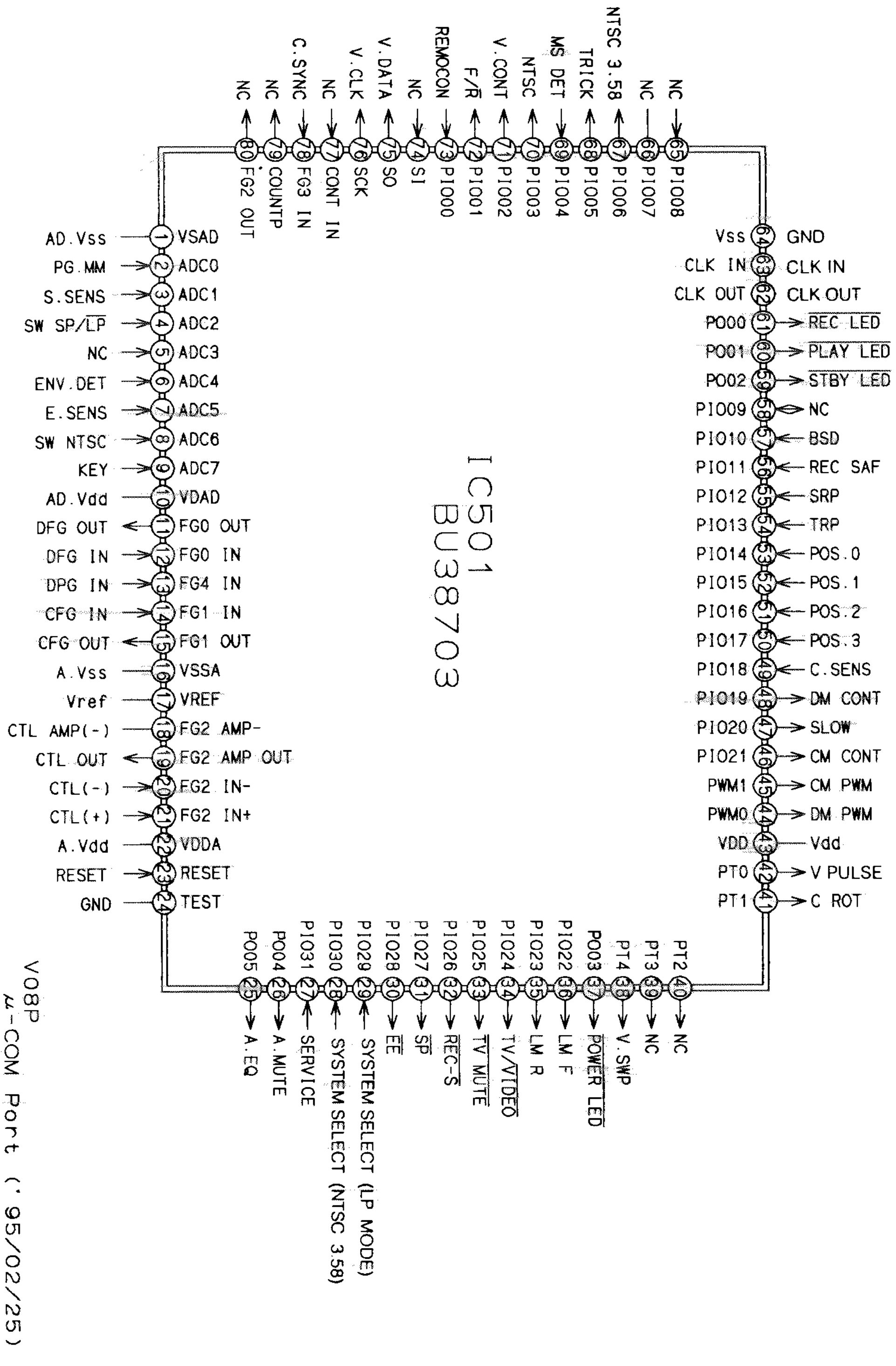
Notes:

1) **For general information in service manual, please refer to the Service Manual of GENERAL INFORMATION Edition 4 No. 82054D (January 1994).**
2) **For repairing SMC (Surface Mounted Components), please refer to the VIDEO SERVICE GUIDE No. VTS81001.**

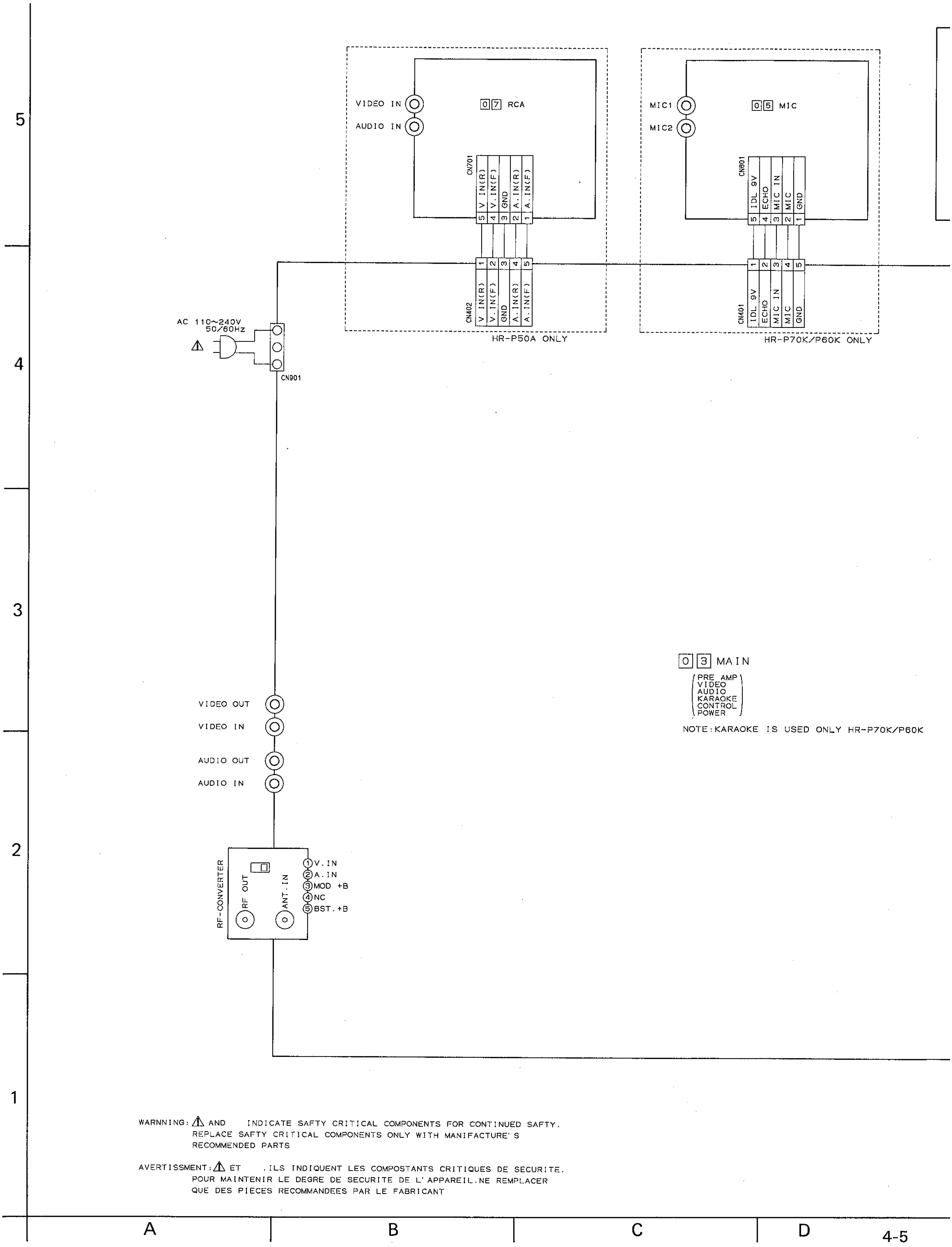
4.1 ABBREVIATIONS

	ABBREVIATION	EXPLANATION
	2H	2_Hour(SP)
	4H	4_Hour(LP)
	6H	6_Hour(SLP/EP)
A	A	Audio_or_Analogue_or_Amplifier
	A.MUTE	Audio_MUTE
	A/C	Audio_and_Control
	AC	Alternating_Current
	ACC	Automatic_Color_Control
	ADJ	ADJust(ment)
	AE	Audio_Erase
	AFC	Automatic_Frequency_Control
	AGC	Automatic_Gain_Control
	ALC	Automatic_Level_Control
	AMP	AMPlifier
	ANT	ANTenna
	APC	Automatic_Phase_Control
	ASSY	ASSemblY
	ATT	ATTenuator
B	B.G	Burst
	B/W	Black_and_White
	BGP	Burst_Gate_Pulse
	BLK	BLock_or_BLack
	BPF	Band_Pass_Filter
C	C	Chroma_or_Color_or_Capstan
	C.SENS	Cassette_SENSor
	C.SYNC	Composite_SYNC
	CAR	CARrier
	CCD	Charge_Coupled_Device
	CCIR	Comite_Conaultatif_International des_Radio_communication
	CH(ch)	CHannel(channel)
	CLK	CLocK
	CM	Capstan_Motor
	COMP	COMParator
	CONT	CONTrol
	CONV	CONVerter
	CTL	ConTroL
	CUR	CURrent
	C_ROT	Chroma_ROTation
D	D	DRUM
	DAC	Digital_to_Analog_Converter
	DC	Direct_Current
	DEEMPHA	DEEMPHAsis
	DEMOD	DEMODulator
	DET	DETetct(DETector)
	DEV	DEViation
	DL	Delay_Line
	DM	Drum_Motor
	DOC	Drop_Out_Compensator
E	E.SENS	End_SENSor
	EE	Electronic_to_Electronic
	EF	Emitter_Follower
	EMPHA	EMPHAsis
	ENH	ENHancer
	ENV	ENVelope
	EP	Extended_Play
	EQ	EQualizer
F	F	Forward_or_Frequency
	FE	Full_track_Erase
	FF	Flip_Flop_or_Fast_Foward
	FG	Frequency_Generator
	FM	Frequency_Modulation
	FREQ	FREQuency
	Fig	Figure
	Fo	resonance_Frequency
G	GEN	GENerator
	GND	GrouND
H	H	Horizontal
	HP	Horizontal(sync)_pulse
	HPF	High_Pass_Filter
	HQ	High_Quality_System
I	IC	Integrated_Circuit
	ID	IDentification
	IDL	IDLe(Voltage)
	INS	INSert
	INV	INVerter
K	KIL	KILler
L	LED	Light_Emitting_Diode
	LIM	LIMitter
	LM	Loading_Motor
	LP	Long_Play
	LPF	Low_Pass_Filter
M	M	Motor
	MES	Middle_East_SECAM
	MIC	MICrophone
	MM	Mono_staybie_Multi
	MOD	MODulator
	M_GND	Motor_GrouND
N	NC	Non_Connection
	NG	Noise_Gate
	NL	Non_Linear
	NP	NTSC→PAL System Convert
	NR	Noise_Reduction
	NTSC	National_Television_System_Committee
O	OSC	OSCillator
P	P/S	Pal/Secam
	PAL	Phase_Alternation_by_Line
	PB	Play_Back
	PB-LC	Play_Back-Low_Chroma
	PCB(P.C.B)	Printed_Circuit_Board
	PG	Pulse_Genertator
Q	Q	Quality_factor
R	R	Reverse
	REC	RECord
	REC_C	RECord_Chroma
	REC-S	RECord_Start
	REC_SAF	RECord_SAFety
	REF	REFerence
	REF-V	REFerence_Vertical_signal
	REG	REGulator
	REV(REVW)	REView(REView)
	REW	REWind
	RF	Radio_Frequency
	RVS	ReVerSe
S	S	Sensor,Shield
	S.SENS	Start_SENSor
	SC	SimulCast
	SECAM	SEquentiel_Couleur_A_Memoire
	SEP	SEParator
	SLD	Side_Lock_Detect
	SLP	Super_Long_Play
	SP	Standard_Play
	SRP	Supply_Reel_Pulse
	STBY	STandBY
	SWP	SWitching_Pulse
	SYNC	SYNChronize
T	TU	Take_Up
	TRK	TRacKing
	TRP	Take_up_Reel_Pulse
	TV	TeleVision
U	UHF	Ultra_High_Frequency
	UNR	UNRegulated(voltage)
V	V	Vertical_or_Video
	VCO	Voltage_Controlled_Oscillator
	VHS	Video_Home_System
	VISS	Video_Index_Search_System
	VP	Vertical(sync)_Pulse
	VR	Variable_Resistor
W	W/D	White/Dark
Y	Y	Luminance

CONTROL CPU


IC501
BU38703
AD.Vss ① VSAD
PG.MM ② ADC0
S.SENS ③ ADC1
SW SP/LP ④ ADC2
NC ⑤ ADC3
ENV.DET ⑥ ADC4
E.SENS ⑦ ADC5
SW NTSC ⑧ ADC6
KEY ⑨ ADC7
AD.Vdd ⑩ VDAD
DFG OUT ⑪ FG0 OUT
DFG IN ⑫ FG0 IN
DPG IN ⑬ FG4 IN
CFG IN ⑭ FG1 IN
CFG OUT ⑮ FG1 OUT
A.Vss ⑯ VSSA
Vref ⑰ VREF
CTL AMP(-) ⑱ FG2 AMP-
CTL OUT ⑲ FG2 AMP OUT
CTL(-) ⑳ FG2 IN-
CTL(+) ㉑ FG2 IN+
A.Vdd ㉒ VDDA
RESET ㉓ RESET
GND ㉔ TEST
PO05 ㉕ A.EQ
PO04 ㉖ A.MUTE
PIO31 ㉗ SERVICE
PIO30 ㉘ SYSTEM SELECT (NTSC 3.58)
PIO29 ㉙ SYSTEM SELECT (LP MODE)
PIO28 ㉚ EE
PIO27 ㉛ SP
PIO26 ㉜ REC-S
PIO25 ㉝ TV MUTE
PIO24 ㉞ TV/VIDEO
PIO23 ㉟ LM R
PIO22 ㊱ LM F
PO03 ㊲ POWER LED
PT4 ㊳ V.SWP
PT3 ㊴ NC
PT2 ㊵ NC
PT1 ㊶ C ROT
PT0 ㊷ V PULSE
VDD ㊸ Vdd
PWM0 ㊹ DM PWM
PWM1 ㊺ CM PWM
PIO21 ㊻ CM CONT
PIO20 ㊼ SLOW
PIO19 ㊽ DM CONT
PIO18 ㊾ C.SENS
PIO17 ㊿ POS.3
PIO16 (51) POS.2
PIO15 (52) POS.1
PIO14 (53) POS.0
PIO13 (54) TRP
PIO12 (55) SRP
PIO11 (56) REC SAF
PIO10 (57) BSD
PIO09 (58) NC
PO02 (59) STBY LED
PO01 (60) PLAY LED
PO00 (61) REC LED
CLK OUT (62) CLK OUT
CLK IN (63) CLK IN
Vss (64) GND
PIO08 (65) NC
PIO07 (66) NC
PIO06 (67) NTSC 3.58
PIO05 (68) TRICK
PIO04 (69) MS DET
PIO03 (70) NTSC
PIO02 (71) V.CONT
PIO01 (72) F/R
PIO00 (73) REMOCON
SI (74) NC
SO (75) V.DATA
SCK (76) V.CLK
CONT IN (77) NC
FG3 IN (78) C.SYNC
COUNTP (79) NC
FG2 OUT (80) NC
V08P
μ-COM Port ('95/02/25)

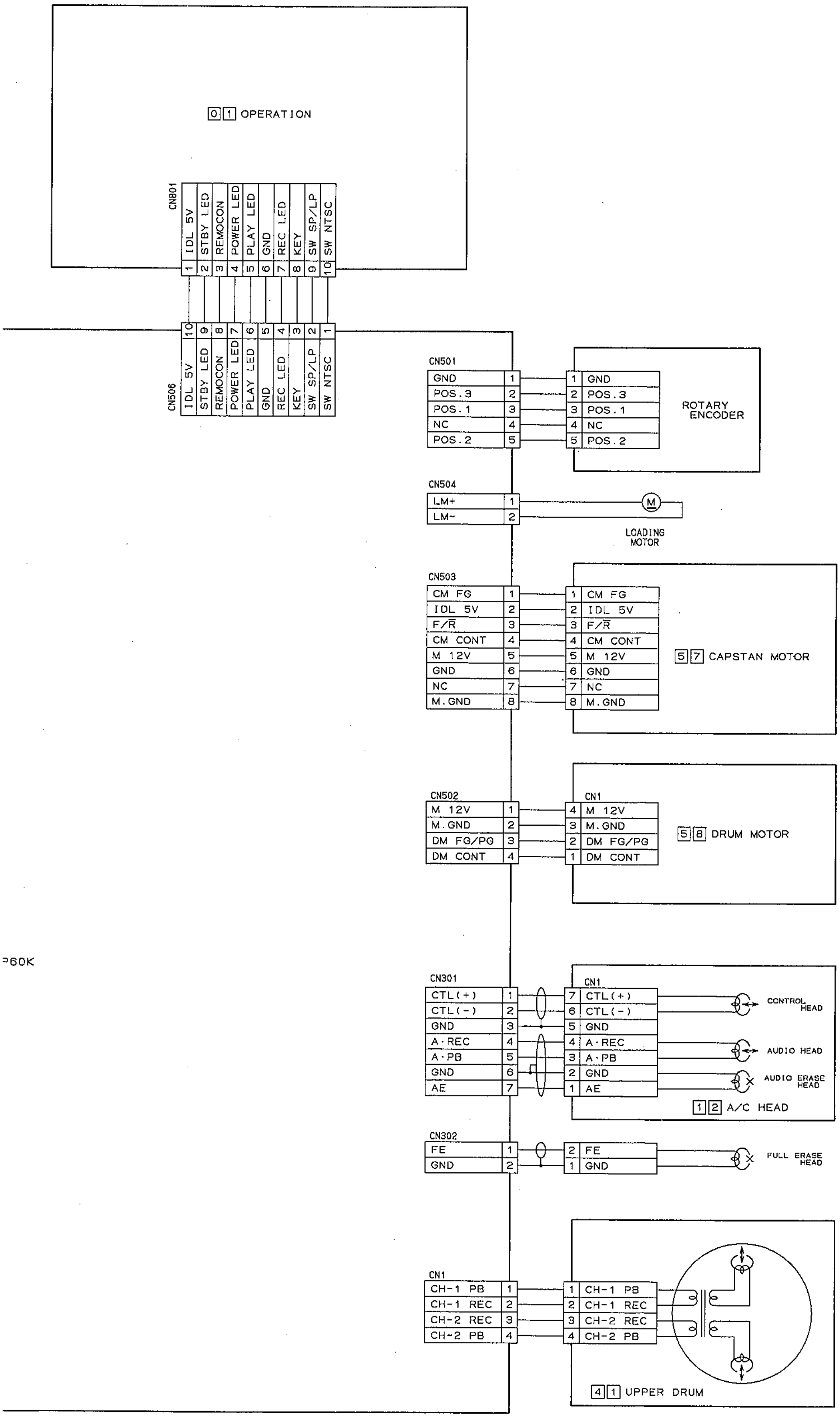
4.2 BOARD INTERCONNECTIONS



WARNNING: ⚠ AND INDICATE SAFTY CRITICAL COMPONENTS FOR CONTINUED SAFTY.
REPLACE SAFTY CRITICAL COMPONENTS ONLY WITH MANIFACTURE'S
RECOMMENDED PARTS

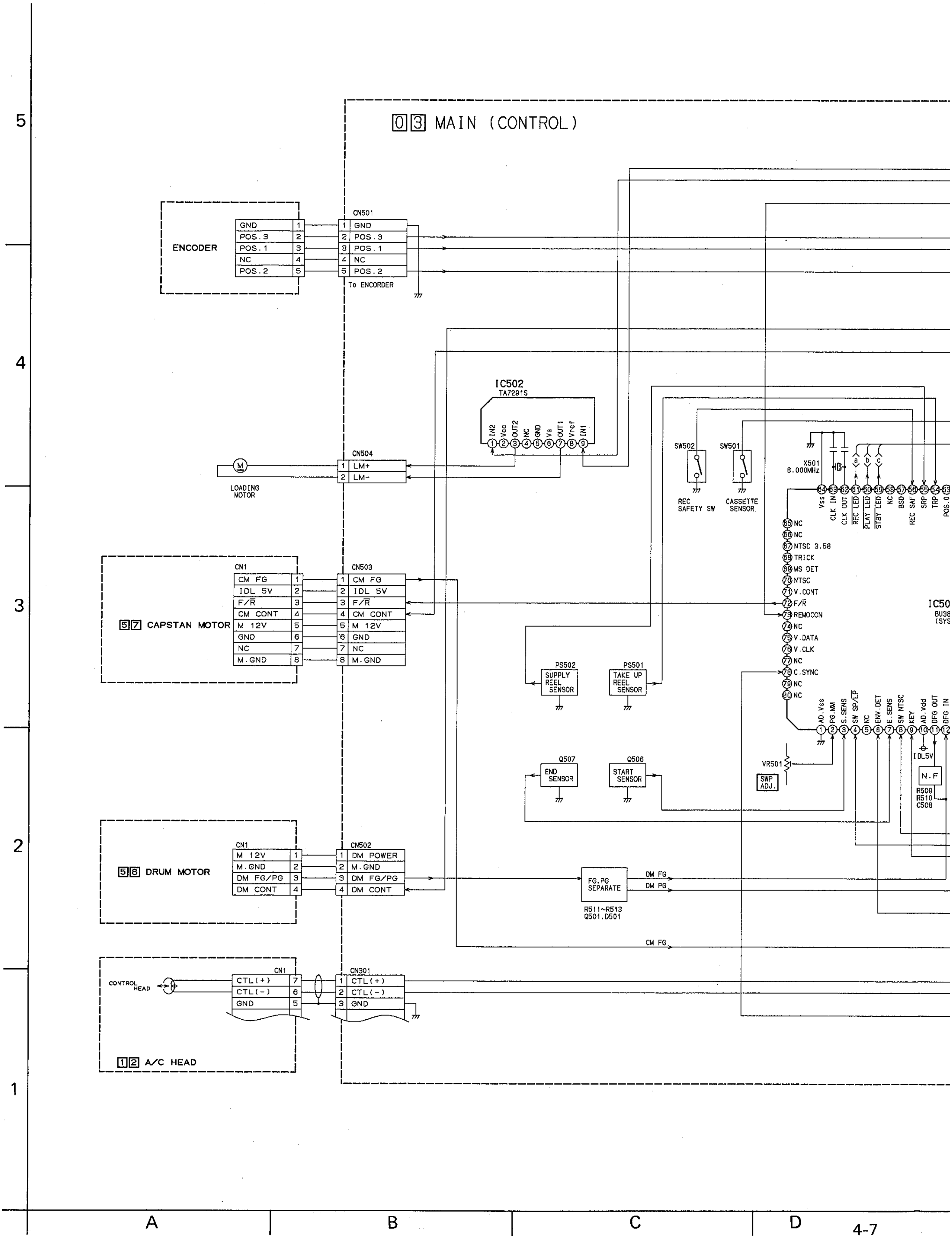
AVERTISSMENT: ⚠ ET .ILS INDIQUENT LES COMPOSTANTS CRITIQUES DE SECURITE.
POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL.NE REMPLACER
QUE DES PIECES RECOMMANDEES PAR LE FABRICANT

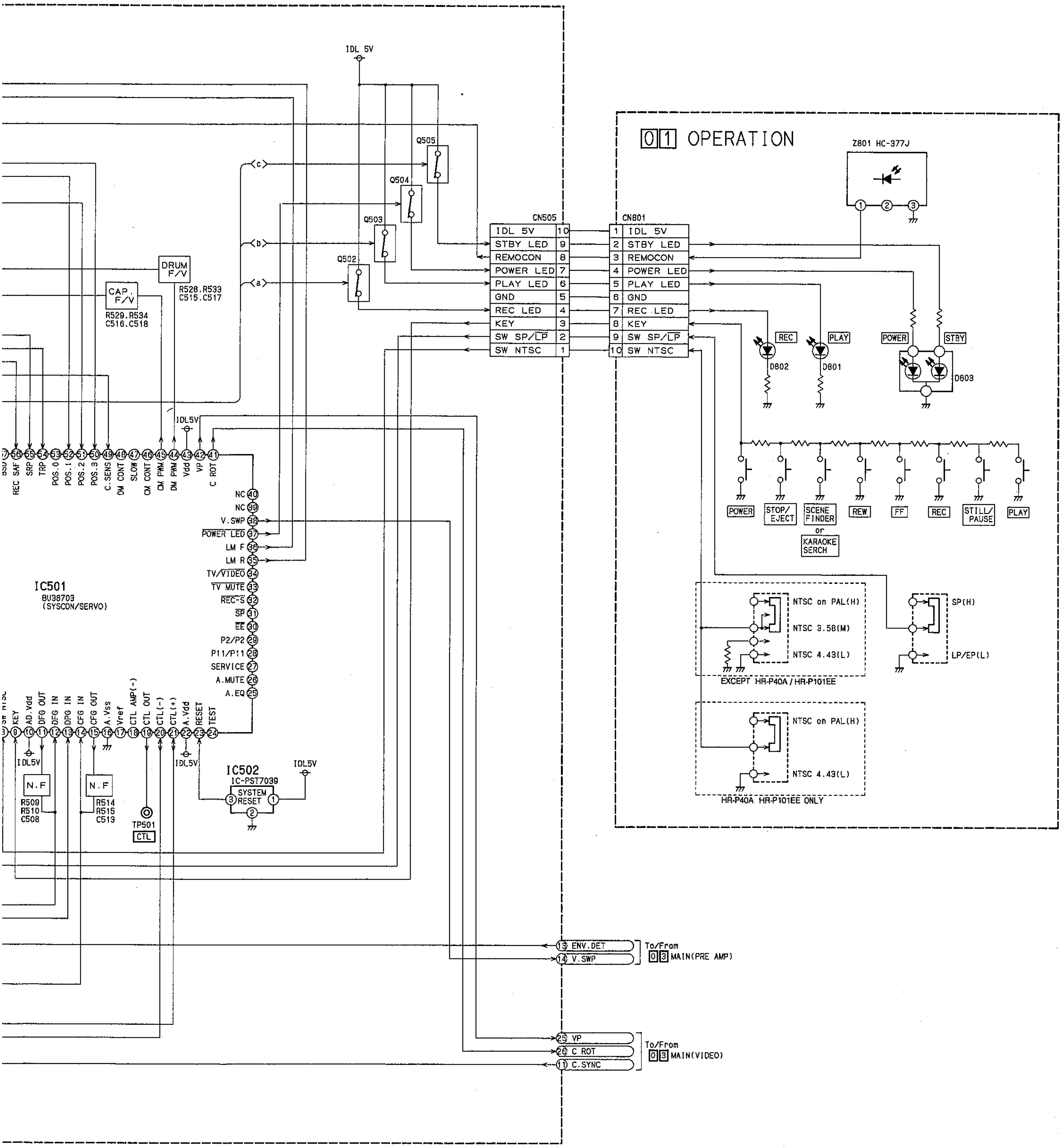
NOTE: ***When ordering parts, be sure to order according to the Part Number indicated in the Parts List.***



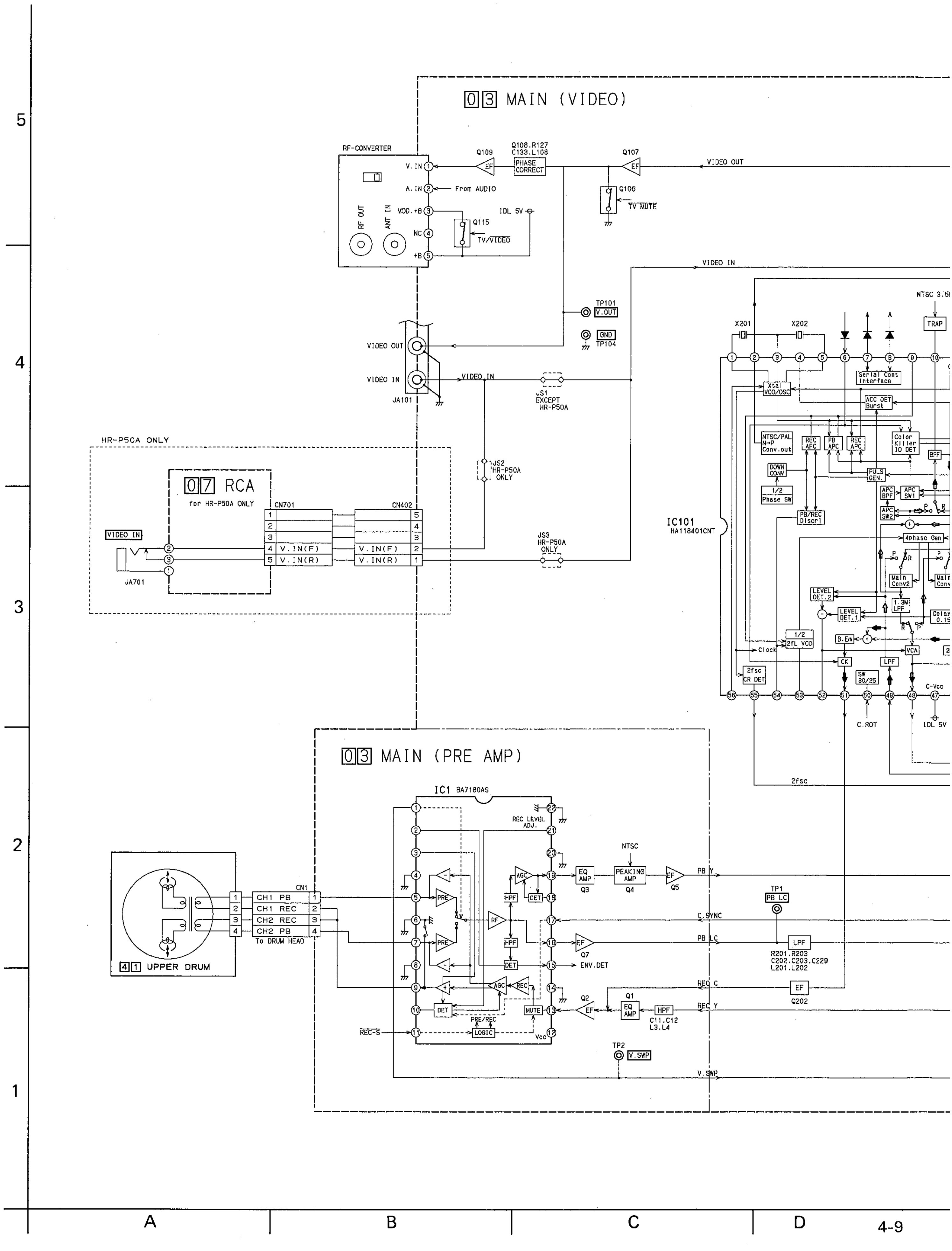
58	DRUM MOTOR
57	CAPSTAN MOTOR
41	UPPER DRUM
12	A/C HEAD
07	RCA
05	MIC
03	MAIN
01	OPERATION
No	NAME

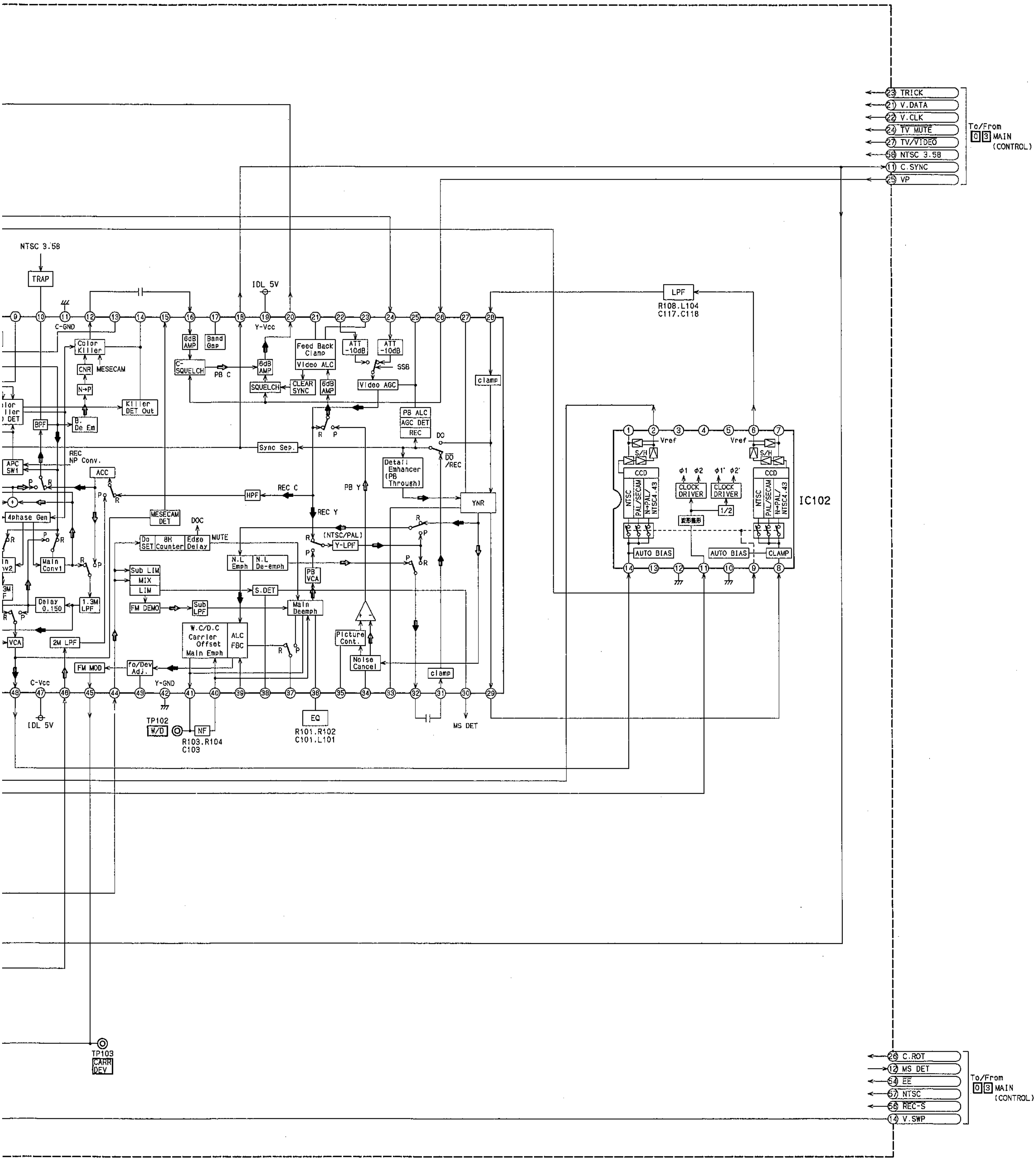
4.3 CONTROL BLOCK DIAGRAM




IDL 5V
Q505
Q504
Q503
Q502
DRUM F/V
R528.R533
C515.C517
CAP. F/V
R529.R534
C516.C518
CN505
IDL 5V 10
STBY LED 9
REMOCON 8
POWER LED 7
PLAY LED 6
GND 5
REC LED 4
KEY 3
SW SP/LP 2
SW NTSC 1
CN801
1 IDL 5V
2 STBY LED
3 REMOCON
4 POWER LED
5 PLAY LED
6 GND
7 REC LED
8 KEY
9 SW SP/LP
10 SW NTSC
01 OPERATION
Z801 HC-377J
REC
D802
PLAY
D801
POWER
STBY
D803
POWER
STOP/ EJECT
SCENE FINDER
or
KARAOKE SERCH
REW
FF
REC
STILL/ PAUSE
PLAY
NTSC on PAL(H)
NTSC 3.58(M)
NTSC 4.43(L)
EXCEPT HR-P40A / HR-P101EE
SP(H)
LP/EP(L)
NTSC on PAL(H)
NTSC 4.43(L)
HR-P40A HR-P101EE ONLY
REC SAF 56
SRP 55
TRP 54
POS.0 53
POS.1 52
POS.2 51
POS.3 50
C.SENS 49
DM CONT 48
SLOW 47
CM CONT 46
CM PWM 45
DM PWM 44
Vdd 43
VP 42
C ROT 41
IDL5V
NC 40
NC 39
V.SWP 38
POWER LED 37
LM F 36
LM R 35
TV/VIDEO 34
TV MUTE 33
REC-S 32
SP 31
EE 30
P2/P2 29
P11/P11 28
SERVICE 27
A.MUTE 26
A.EQ 25
IC501
BU38703
(SYSCON/SERVO)
KEY 9
AD.Vdd 10
DFG OUT 11
DFG IN 12
DPG IN 13
CFG IN 14
CFG OUT 15
A.Vss 16
Vref 17
CTL AMP(-) 18
CTL OUT 19
CTL(-) 20
CTL(+) 21
A.Vdd 22
RESET 23
TEST 24
IDL5V
N.F
R509
R510
C508
N.F
R514
R515
C513
TP501
CTL
IDL5V
IC502
IC-PST7039
SYSTEM RESET
IDL5V
15 ENV.DET
14 V.SWP
To/From
03 MAIN(PRE AMP)
25 VP
26 C ROT
11 C.SYNC
To/From
03 MAIN(VIDEO)

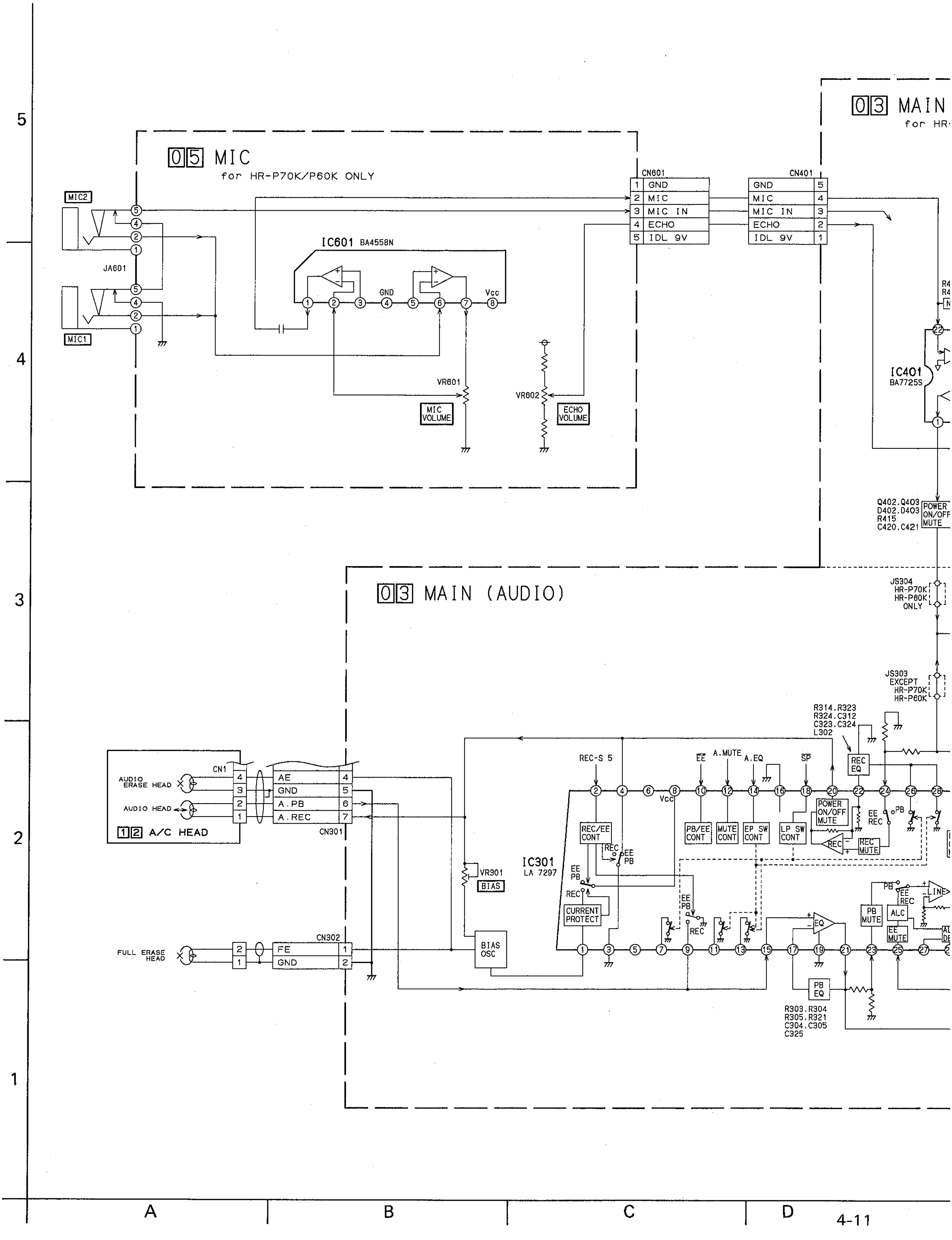
4.4 VIDEO BLOCK DIAGRAM





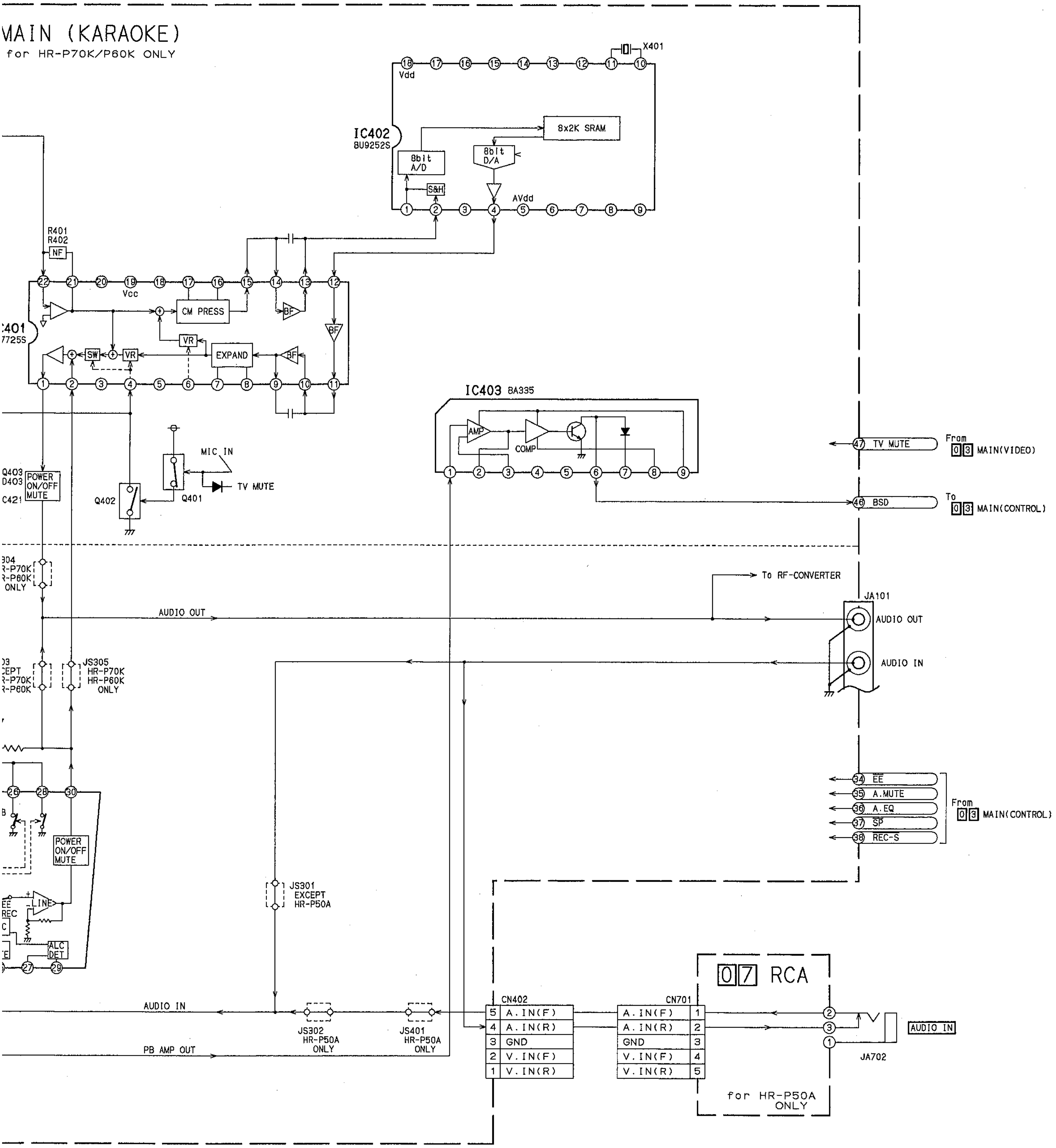
TRICK
V.DATA
V.CLK
TV MUTE
TV/VIDEO
NTSC 3.58
C.SYNC
VP
To/From 03 MAIN (CONTROL)
NTSC 3.58
TRAP
IDL 5V
Y-Vcc
C-GND
LPF
R108.L104 C117.C118
Color Killer
CNR
MESECAM
N→P
B. De Em
Killer DET Out
BPF
6dB AMP
Band Gap
C-SQUELCH
PB C
SQUELCH
Feed Back Clamp
Video ALC
CLEAR SYNC
ATT -10dB
SSB
Video AGC
clamp
PB ALC
AGC DET
REC
DO
DO /REC
Sync Sep.
Detail Enhancer (PB Through)
YNR
PB Y
REC C
HPF
REC Y
REC NP Conv.
APC SW1
ACC
4phase Gen
MESECAM DET
DOC
Do SET
8H Counter
Edge Delay
MUTE
(NTSC/PAL)
Y-LPF
N.L Emph
N.L De-emph
PB VCA
Main Conv1
1.3M LPF
Delay 0.150
Sub LIM
MIX
LIM
S.DET
FM DEMO
Sub LPF
Main Deemph
W.C/D.C Carrier Offset Main Emph
ALC FBC
Picture Cont.
Noise Cancel
VCA
2M LPF
FM MOD
fo/Dev Adj.
C-Vcc
Y-GND
IDL 5V
TP102 W/D
NF
R103.R104 C103
EQ
R101.R102 C101.L101
MS DET
Vref
S/H
CCD
NTSC
PAL/SECAM
N-PAL/ NTSC4.43
φ1 φ2
φ1' φ2'
CLOCK DRIVER
1/2
波形整形
AUTO BIAS
CLAMP
IC102
TP103 CARR DEV
C.ROT
MS DET
EE
NTSC
REC-S
V.SWP
To/From 03 MAIN (CONTROL)

4.5 AUDIO BLOCK DIAGRAM

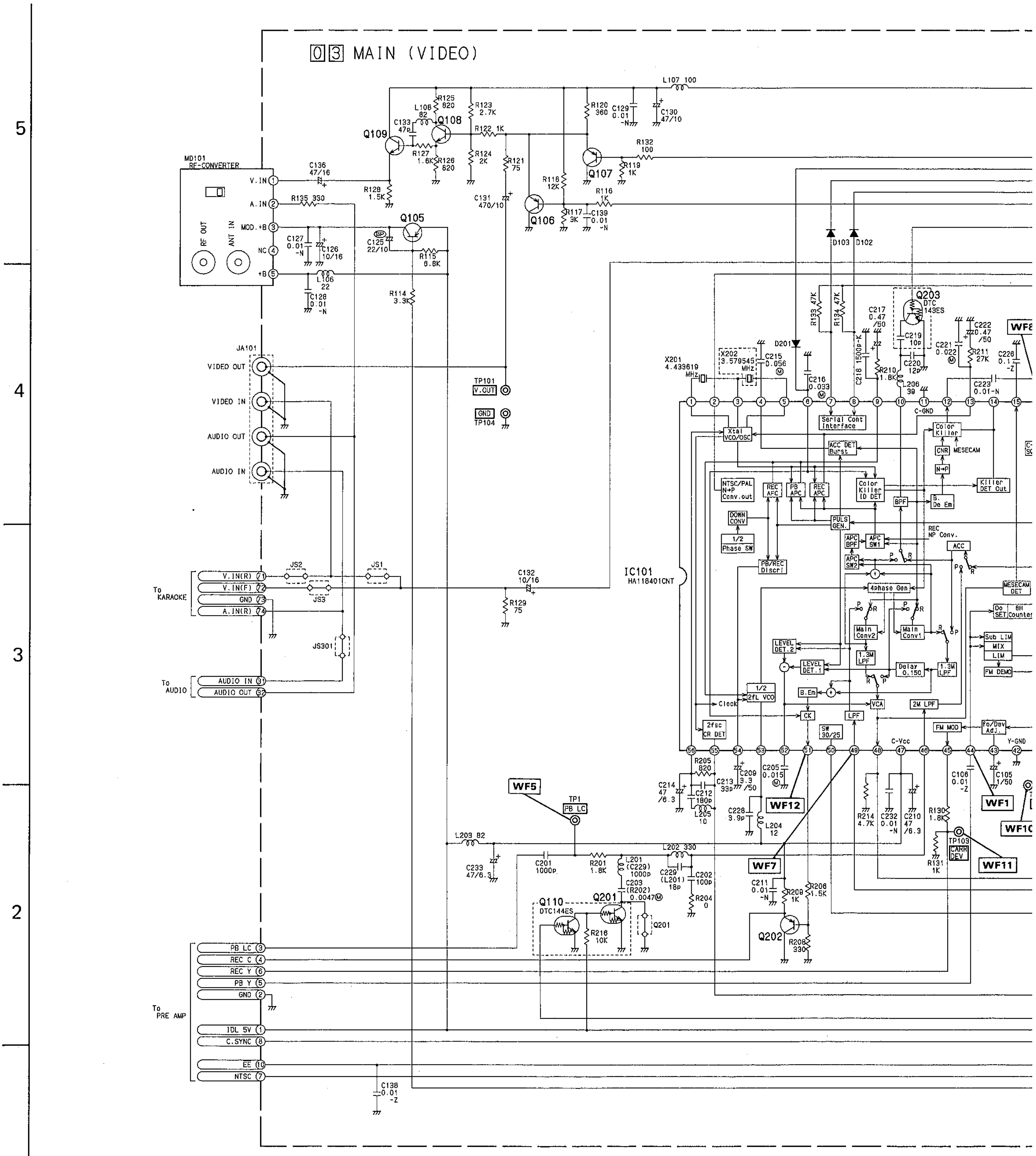


MAIN (KARAOKE)

for HR-P70K/P60K ONLY



4.6 VIDEO SCHEMATIC DIAGRAM



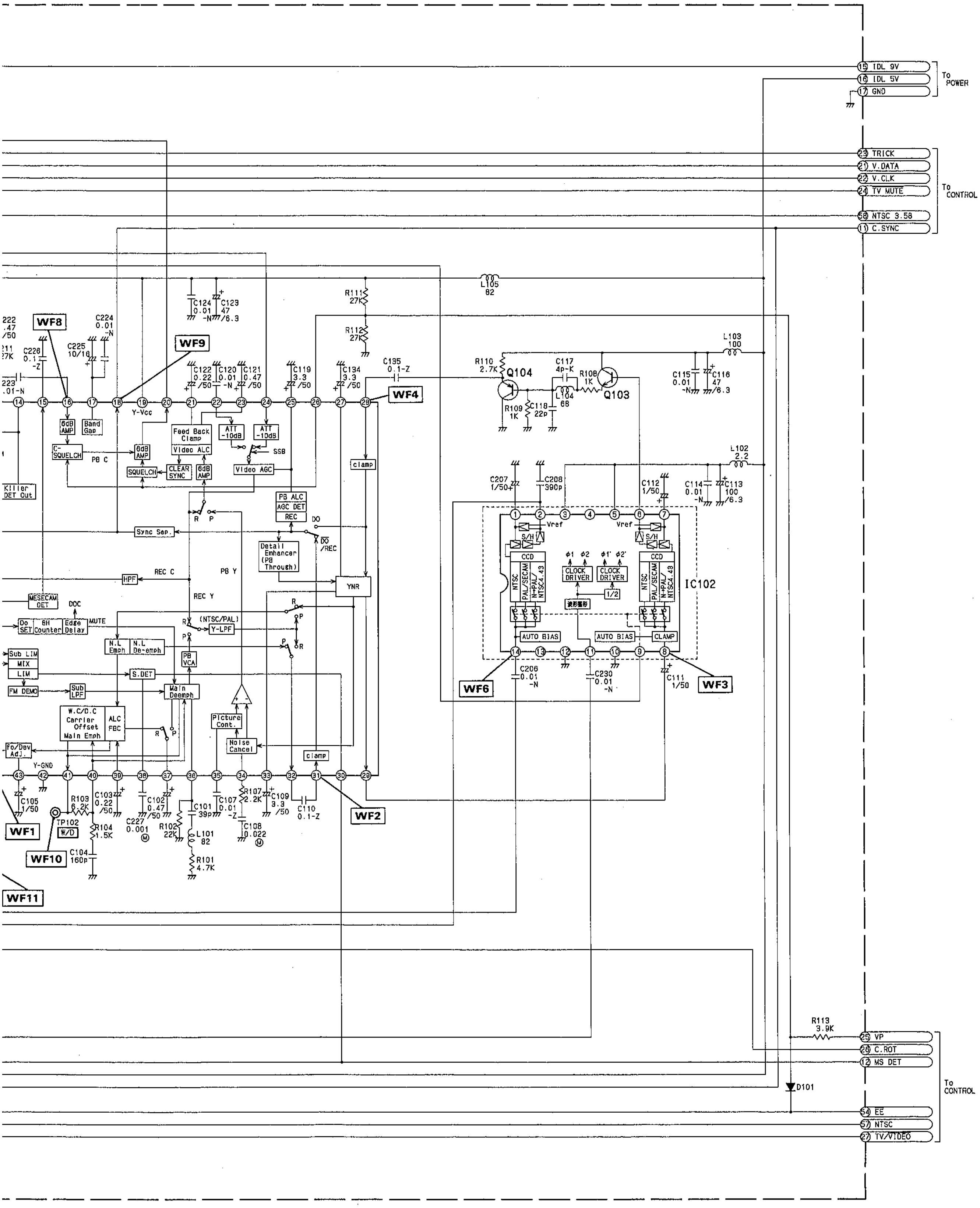
MODEL	SYMBOL No.									
	R216	C219	Q110	Q201	R203	IC102	X202	JS1	JS2	JS3	JS301
HR-P70K	○	○	○	DIC144ES	○	MSM7460-60RS	○	○	×	×	○
HR-P60K	○	○	○	DIC144ES	○	MSM7460-60RS	○	○	×	×	○
HR-P50A	×	×	×	JUMPER	○	MSM7460-60RS	○	×	○	○	×
HR-P40A	×	×	×	JUMPER	×	MSM7460-61RS	×	○	×	×	○
HR-P101EE	×	×	×	JUMPER	×	MSM7460-61RS	×	○	×	×	○

O: Employed X : Not Employed

NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS
ALL CAPACITORS IN µF (p=pF)
ALL ELECTROLYTIC CAPACITORS IN µF/WV
ALL INDUCTORS IN µH

ALL DIODES ARE 1SS120
ALL PNP TRANSISTORS ARE 2SA933S(Q.R.S)
ALL NPN TRANSISTORS ARE 2SC1740S(Q.R.S)

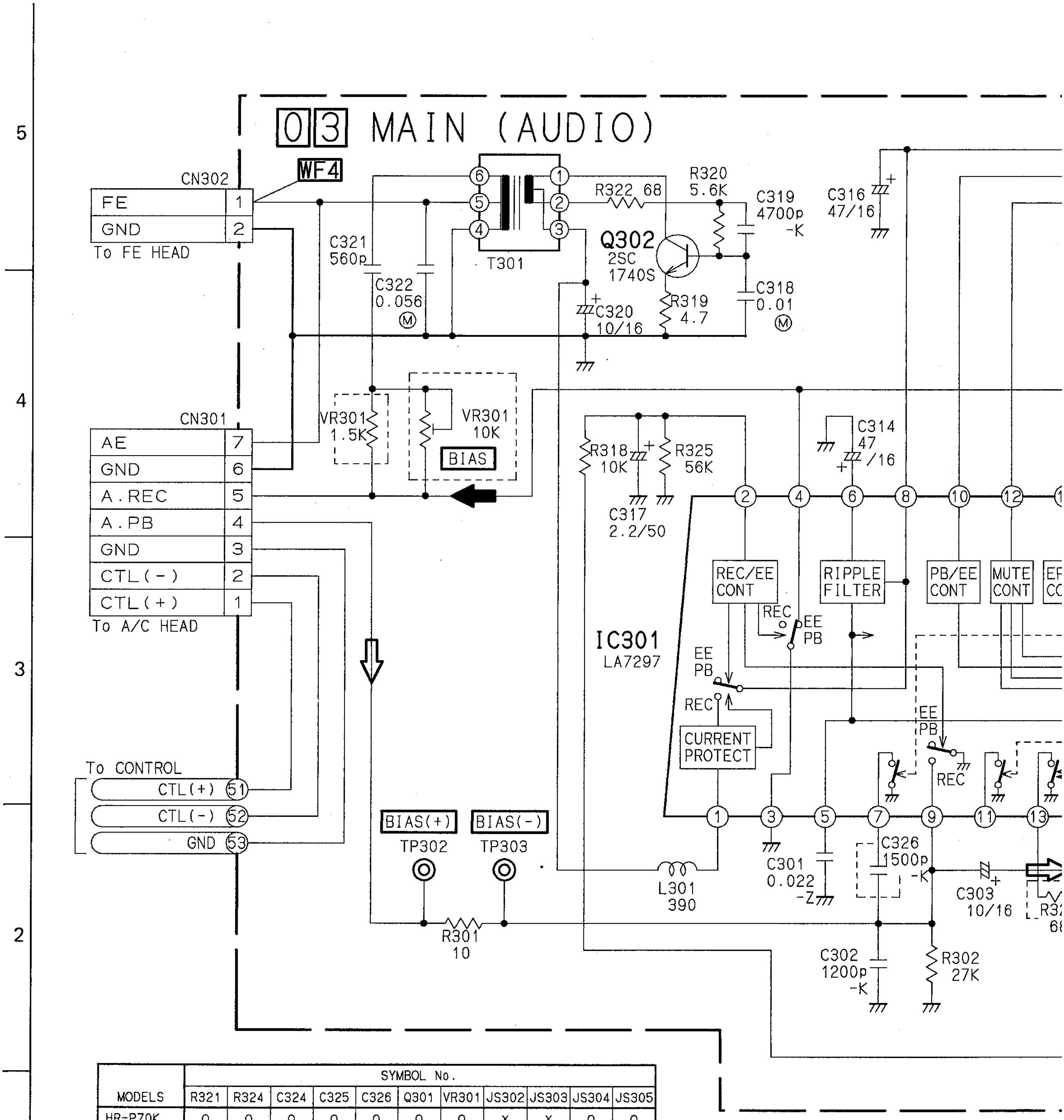
NOTE: ***When ordering parts, be sure to order according to the Part Number indicated in the Parts List.***



/WV

.R.S)
Q.R.S)

4.7 AUDIO SCHEMATIC DIAGRAM



MODELS	SYMBOL No.										
	R321	R324	C324	C325	C326	Q301	VR301	JS302	JS303	JS304	JS305
HR-P70K	o	o	o	o	o	o	o	x	x	o	o
HR-P60K	o	o	o	o	o	o	o	x	x	o	o
HR-P50A	x	x	x	x	x	x	1.5K	o	o	x	x
HR-P40A	x	x	x	x	x	x	1.5K	x	o	x	x
HR-P101EE	x	x	x	x	x	x	1.5K	x	o	x	x

o:Employed x:Not Employed

NOTE

UNLESS OTHERWIS

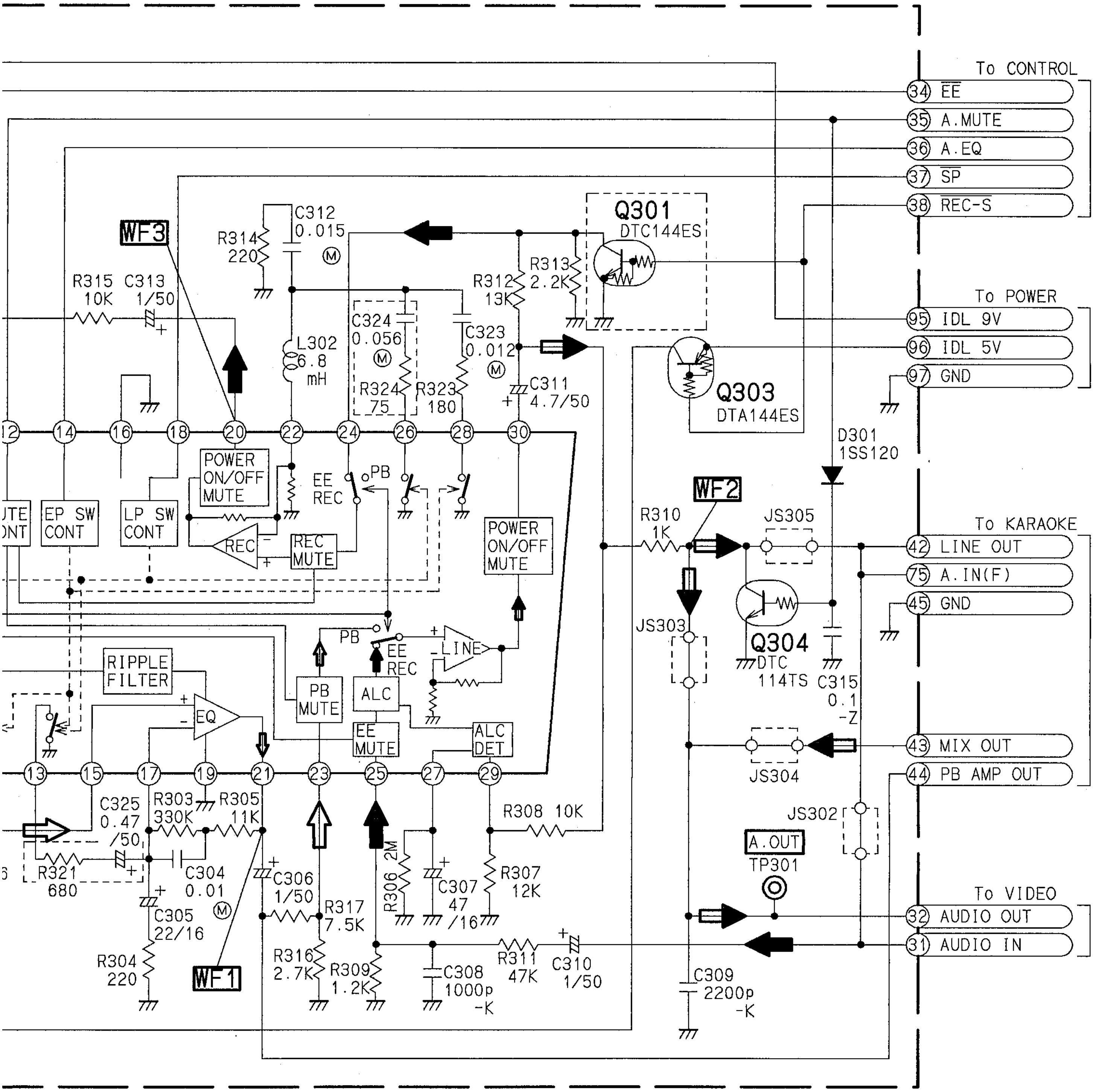
ALL RESISTOR

ALL INDUCTOR

1

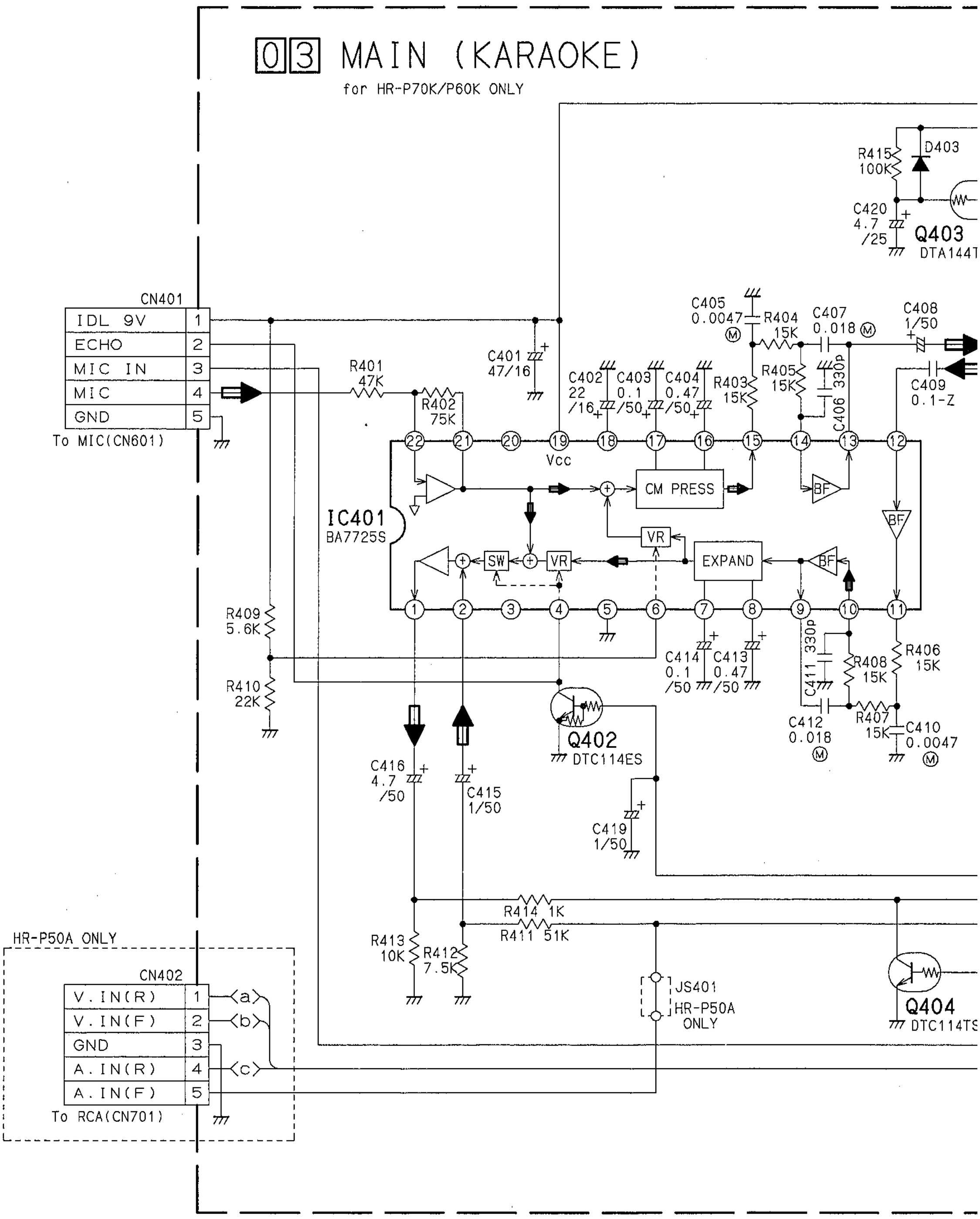
A B C D

NOTE : ***When ordering parts, be sure to order according to the Part Number indicated in the Parts List.***



ERWISE SPECIFIED
STORS IN OHMS　　　ALL CAPACITORS IN μF (p=pF)
CTORS IN μH　　　ALL ELECTROLYTIC CAPACITORS IN μF/WV

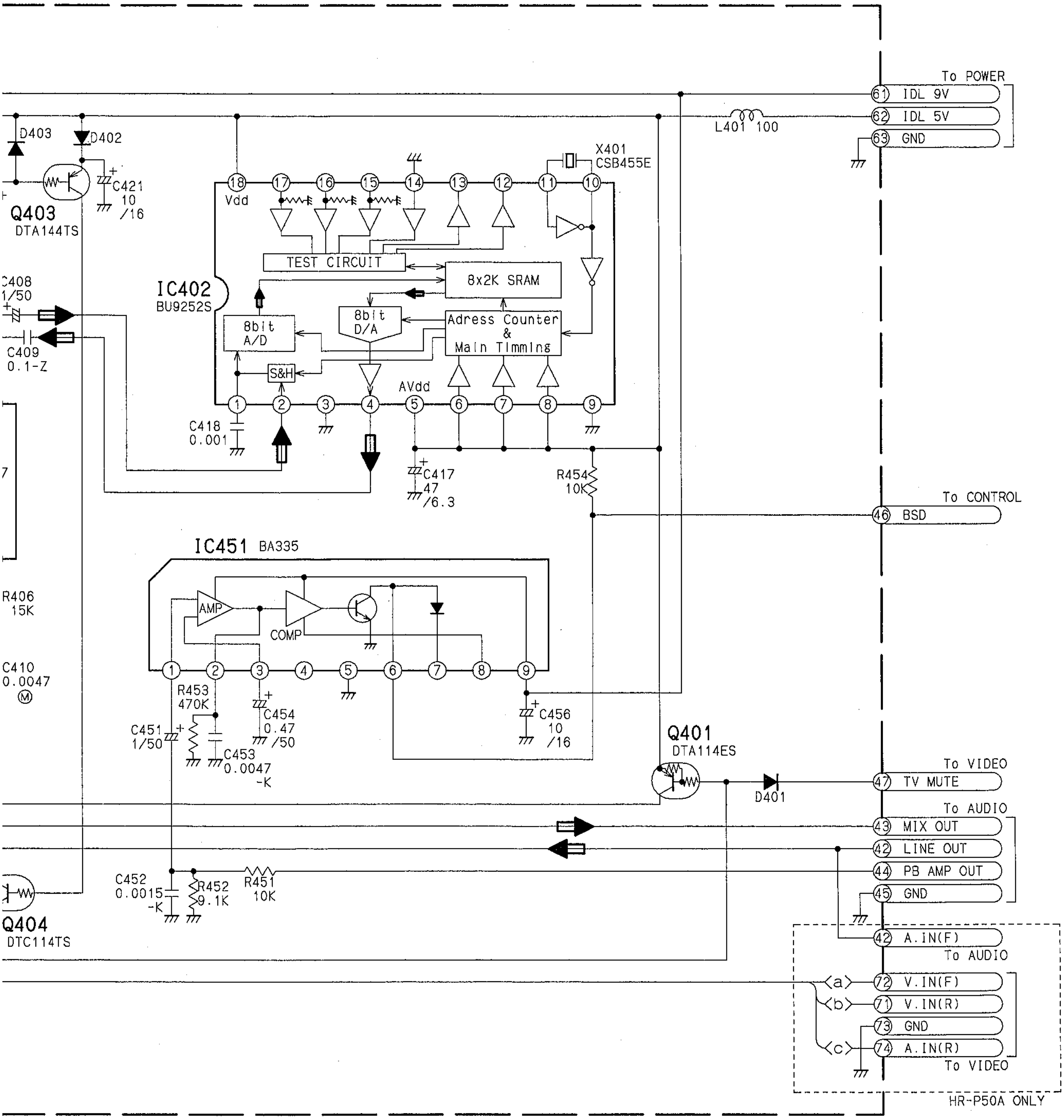
4.8 KARAOKE SCHEMATIC DIAGRAM



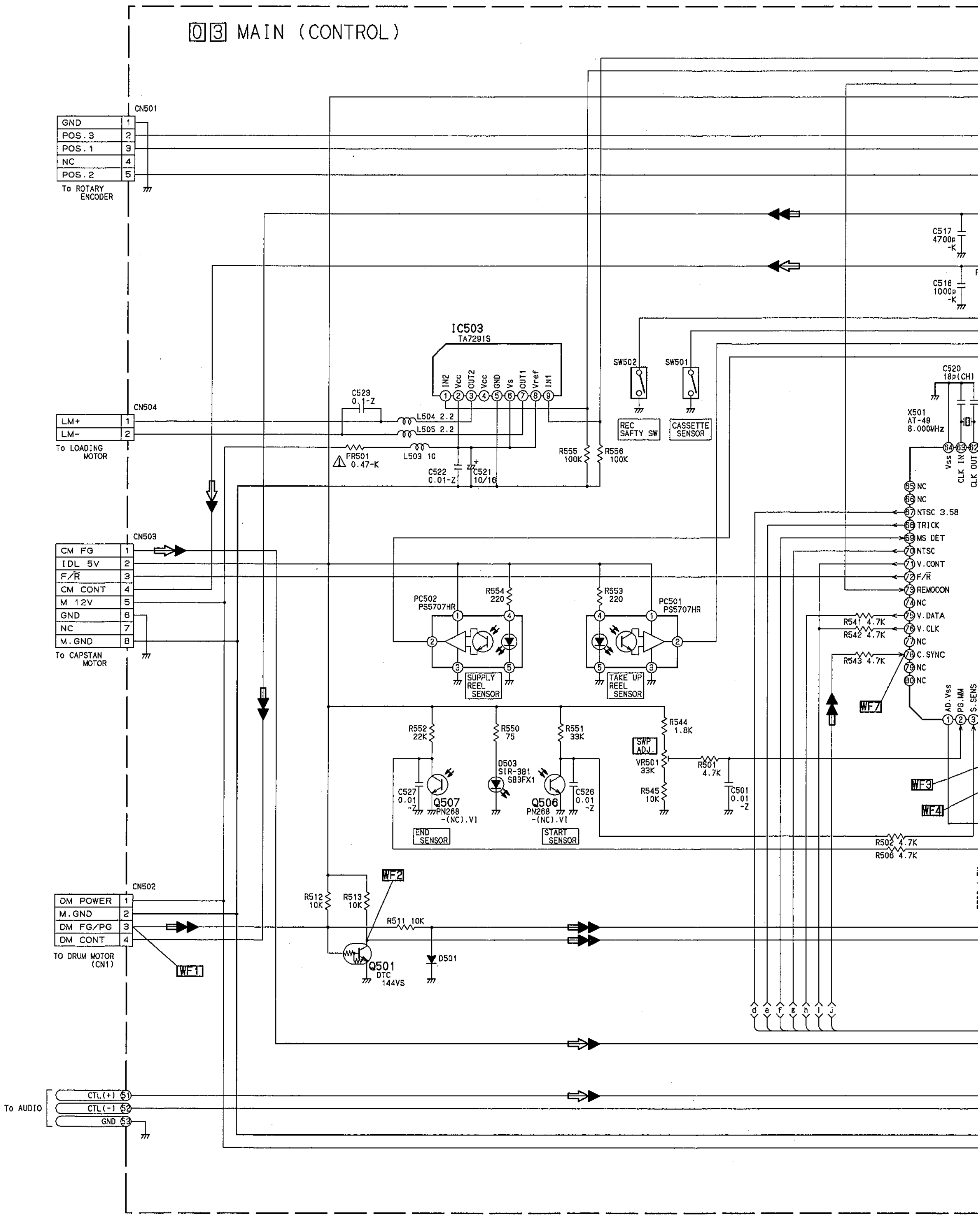
NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS
ALL CAPACITORS IN μF (p=pF)
ALL ELECTROLYTIC CAPACITORS IN μF/WV
ALL INDUCTORS IN μH

ALL DIODES ARE 1SS120

NOTE: ***When ordering parts, be sure to order according to the Part Number indicated in the Parts List.***



4.9 CONTROL SCHEMATIC DIAGRAM



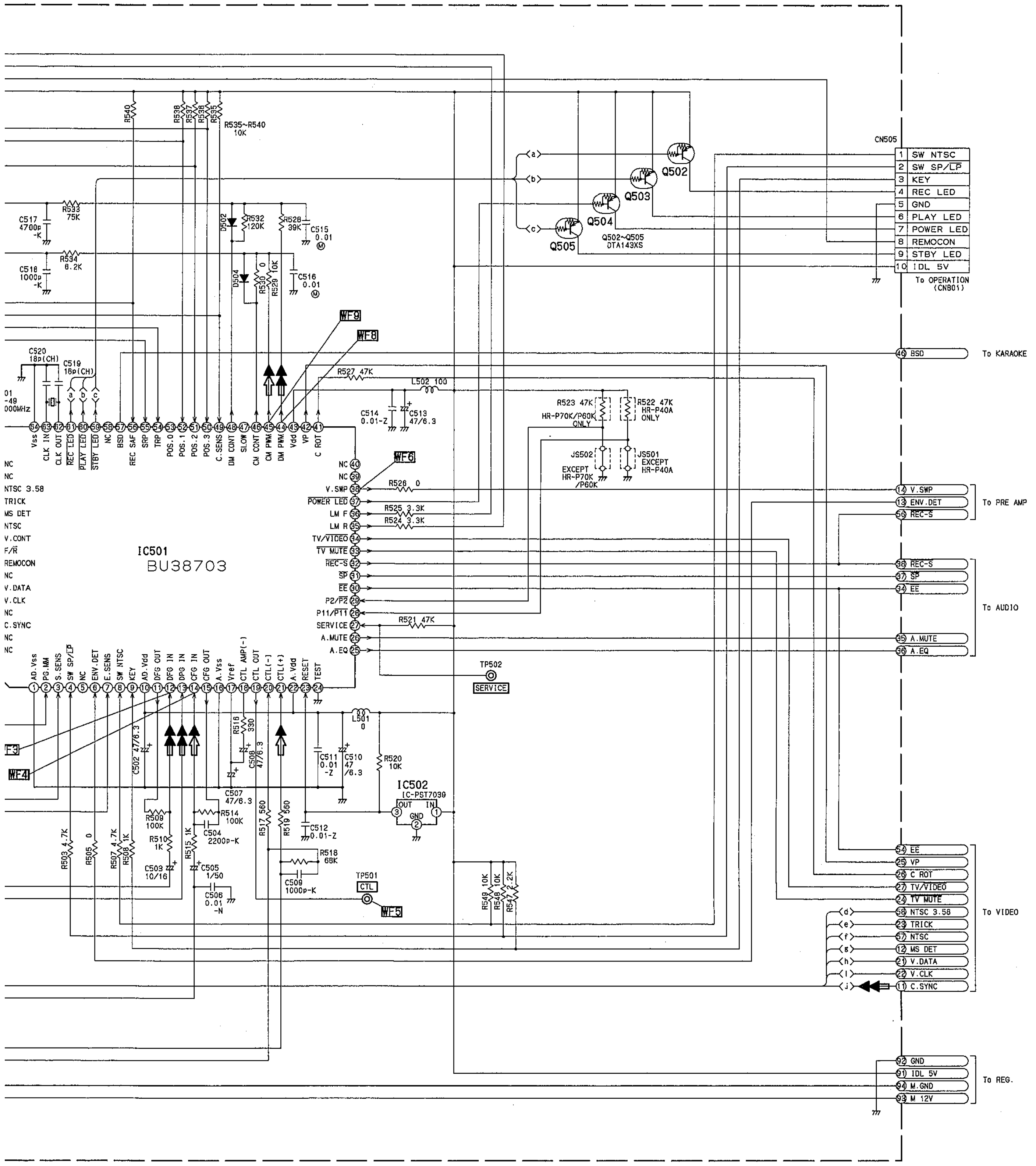
WARNNING: ⚠ AND INDICATE SAFTY CRITICAL COMPONENTS FOR CONTINUED SAFTY.
REPLACE SAFTY CRITICAL COMPONENTS ONLY WITH MANIFACTURE'S
RECOMMENDED PARTS

AVERTISSMENT: ⚠ ET .ILS INDIQUENT LES COMPOSTANTS CRITIQUES DE SECURITE.
POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL.NE REMPLACER
QUE DES PIECES RECOMMANDEES PAR LE FABRICANT

NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS
ALL CAPACITORS IN μF (p=pF)
ALL ELECTROLYTIC CAPACITORS IN μF/WV
ALL INDUCTORS IN μH

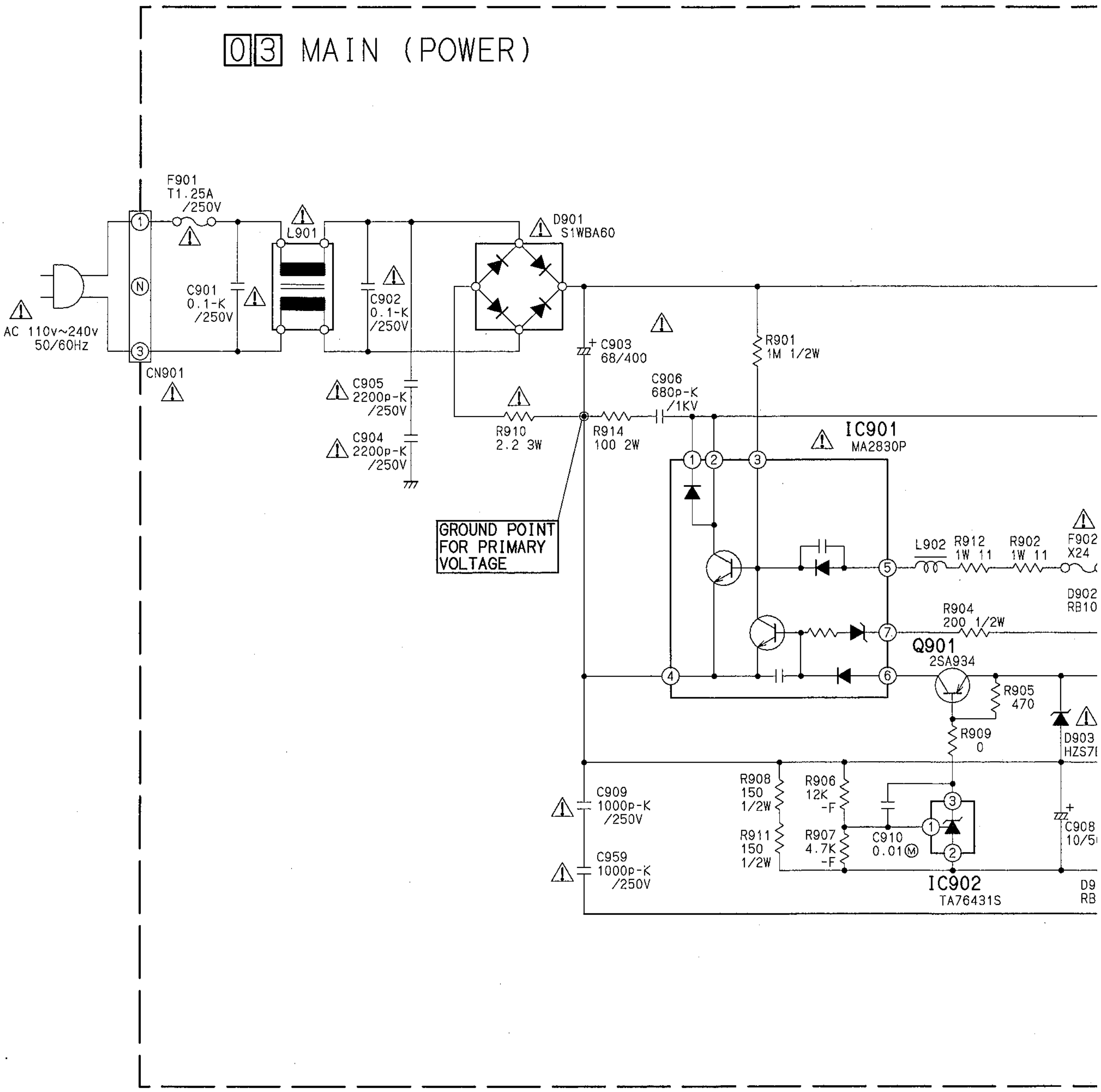
ALL DIODES ARE 1SS120

NOTE: ***When ordering parts, be sure to order according to the Part Number indicated in the Parts List.***



E | F | G | H

4.10 POWER (SW REG) SCHEMATIC DIAGRAM

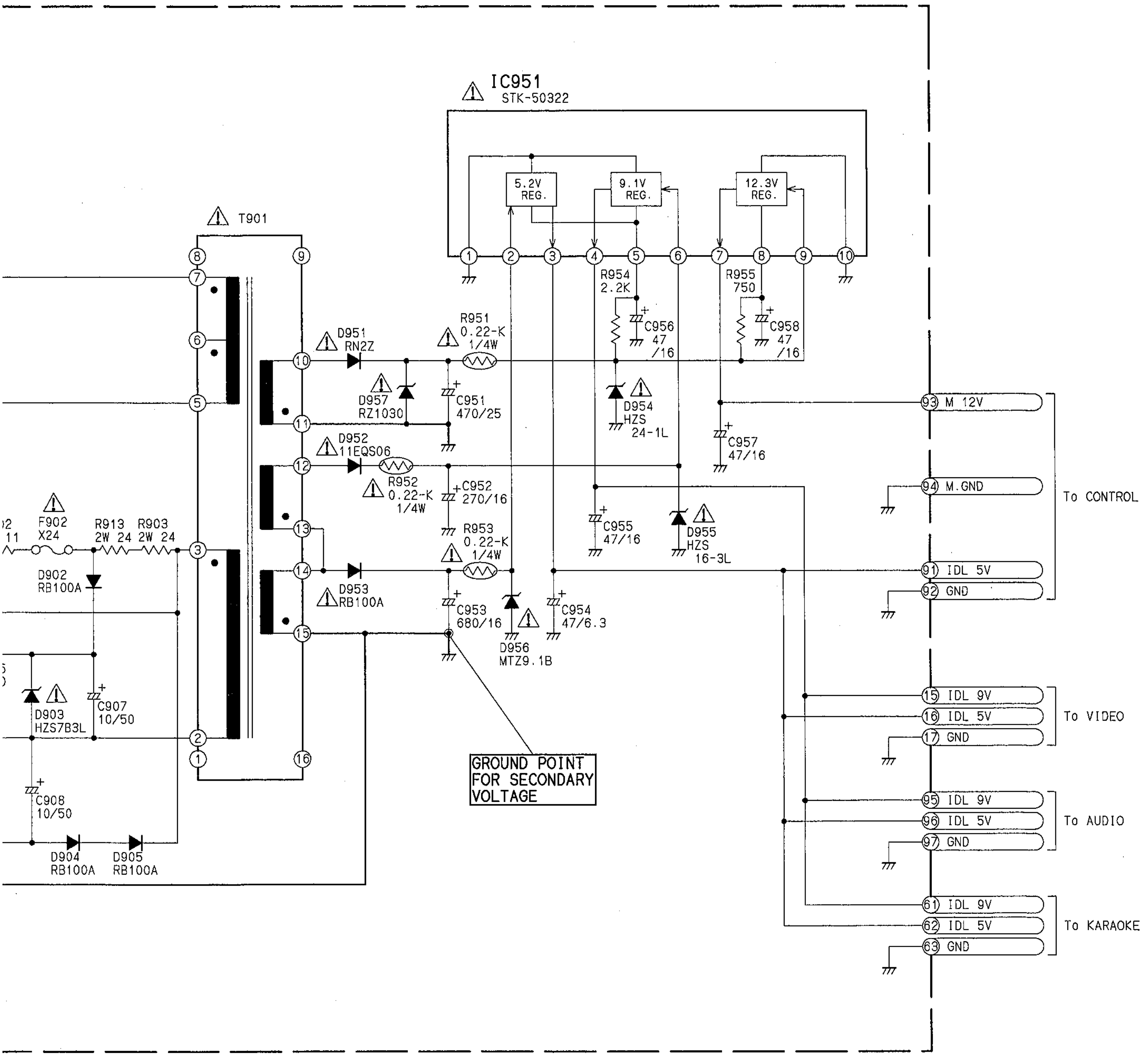


WARNNING: ⚠ INDICATE SAFTY CRITICAL COMPONENTS FOR CONTINUED SAFTY.
REPLACE SAFTY CRITICAL COMPONENTS ONLY WITH MANIFACTURE' S
RECOMMENDED PARTS

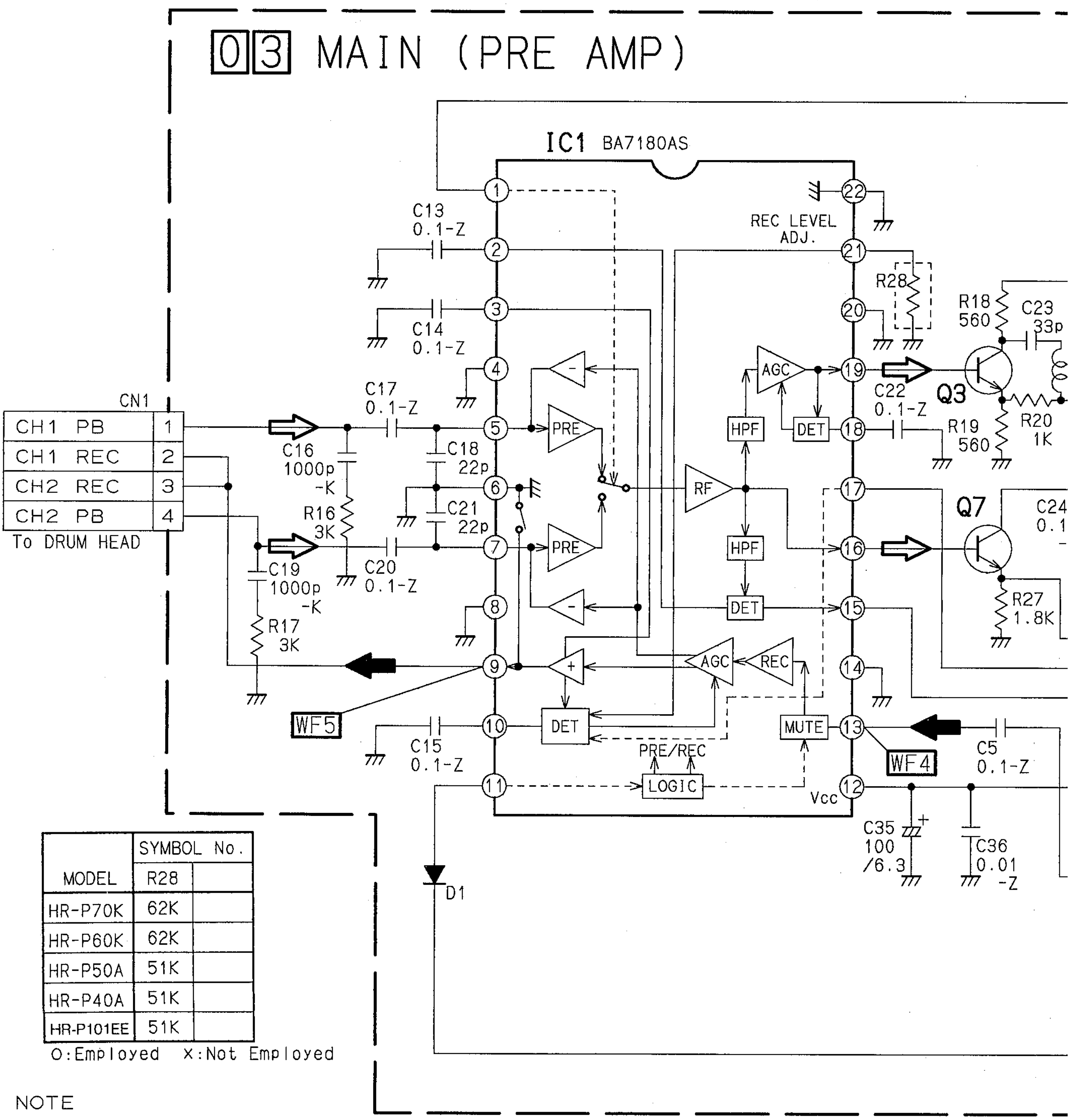
AVERTISSMENT: ⚠ .ILS INDIQUENT LES COMPOSTANTS CRITIQUES DE SECURITE.
POUR MAINTENIR LE DEGRE DE SECURITE DE L' APPAREIL.NE REMPLACER
QUE DES PIECES RECOMMANDEES PAR LE FABRICANT

NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS
ALL CAPACITORS IN μF (p=pF)
ALL ELECTROLYTIC CAPACITORS IN μF/WV
ALL INDUCTORS IN μH

NOTE: ***When ordering parts, be sure to order according to the Part Number indicated in the Parts List.***



4.11 PRE AMP SCHEMATIC DIAGRAM



MODEL	SYMBOL No. R28	
HR-P70K	62K	
HR-P60K	62K	
HR-P50A	51K	
HR-P40A	51K	
HR-P101EE	51K	

O:Employed X:Not Employed

NOTE

UNLESS OTHERWISE SPECIFIED

ALL RESISTORS IN OHMS

ALL CAPACITORS IN μF (p=pF)

ALL ELECTROLYTIC CAPACITORS IN μF/WV

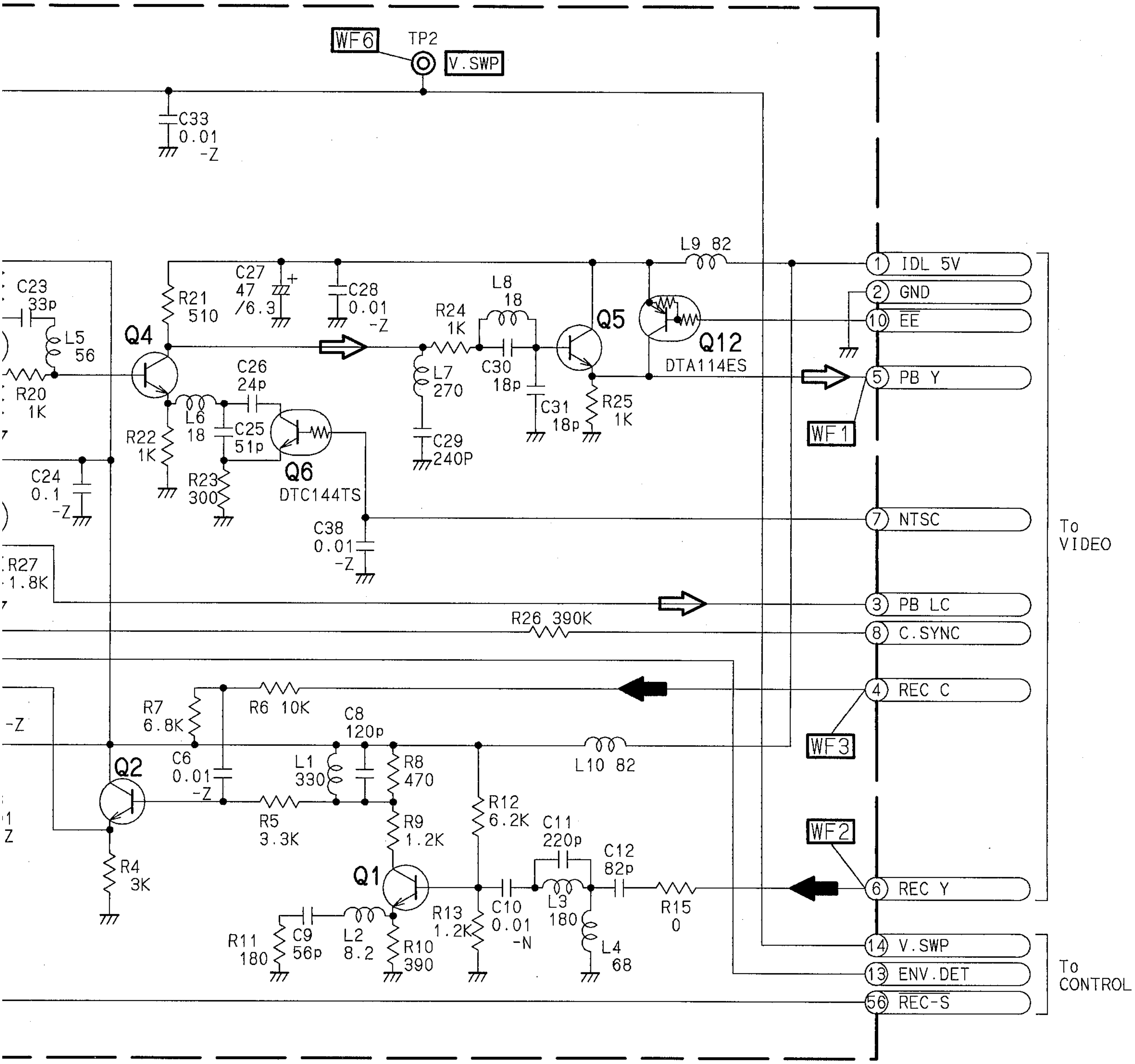
ALL INDUCTORS IN μH

ALL DIODES ARE 1SS120

ALL PNP TRANSISTORS ARE

ALL NPN TRANSISTORS ARE

NOTE: ***When ordering parts, be sure to order according to the Part Number indicated in the Parts List.***



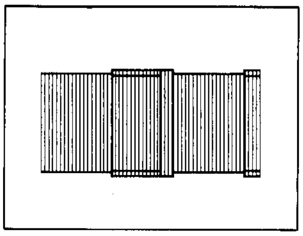
120
S ARE 2SA933S(Q.R.S)
S ARE 2SC1740S(Q.R.S)

4.12 MAIN CIRCUIT BOARD

1. WAVE FORMS

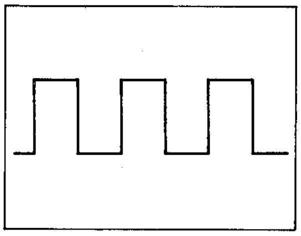
-PRE AMP-

WF1 PB Y



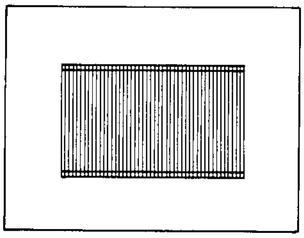
PB 0.48 Vp-p
10 mV / 5 m sec / DIV

WF6 IC1-1 TP2,V. SWP



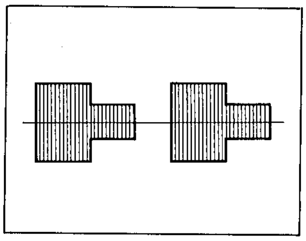
REC / PB 5.1 Vp-p
0.1V / 10 m sec / DIV

WF2 REC Y



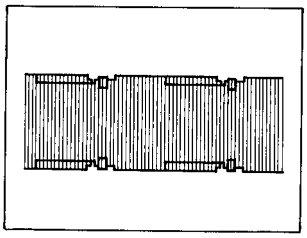
REC 0.2 Vp-p
5 mV / 5 msec / DIV

WF3 REC C



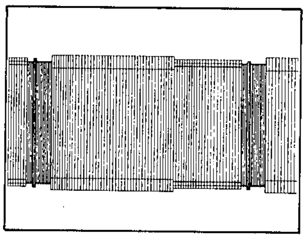
REC 0.09 Vp-p
5 mV / 5 m sec / DIV

WF4 IC1-13



REC 0.08 Vp-p
5 mV / 5 m sec / DIV

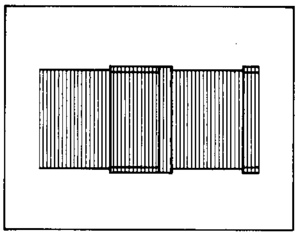
WF5 IC1-9



REC 2.0 Vp-p
50 mV / 5 m sec / DIV

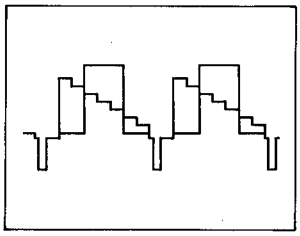
-VIDEO-

WF1 IC101-44



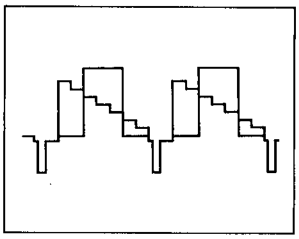
PB 0.48 Vp-p
10 mV / 5 m sec / DIV

WF2 IC101-31



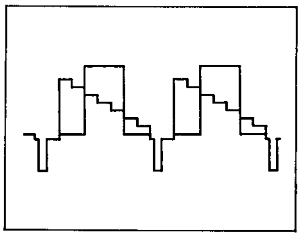
REC 0.43 Vp-p
10 mV / 20μ sec / DIV

WF3 IC102-9



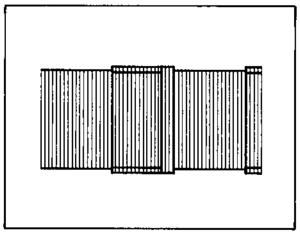
REC 0.56 Vp-p
10 mV /20μ sec / DIV

WF4 IC101-28



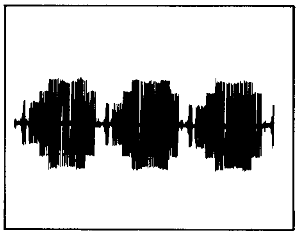
REC 0.43 Vp-p
10 mV /20μ sec / DIV

WF5 TP 1 PB LC



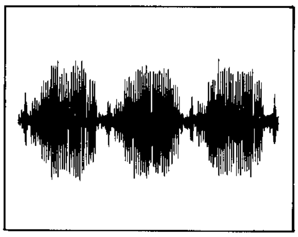
PB 0.22 Vp-p
5mV / 5 m sec / DIV

WF6 IC102-14



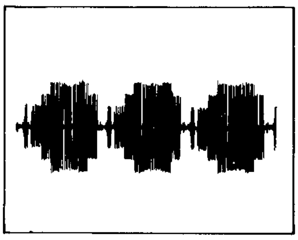
REC 0.24 Vp-p
10 mV / 20μ sec / DIV

WF7 IC101-49



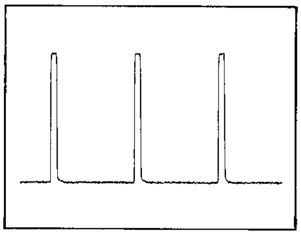
REC/PB 0.34Vp-p
10 mV / 20μ sec / DIV

WF8 IC101-16



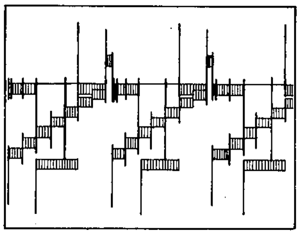
PB 0.56Vp-p
20 mV / 20μ sec / DIV

WF9 IC101-18



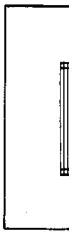
REC / PB 5.1 Vp-p
0.1 V / 20μ sec / DIV

WF10 IC101-41 TP102,W/D

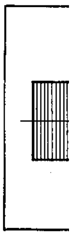


REC 1.24 Vp-p
20 mV / 20μ sec / DIV

WF11

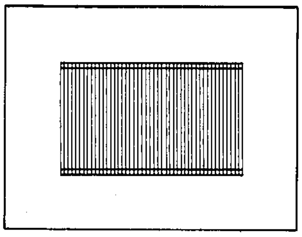


WF12



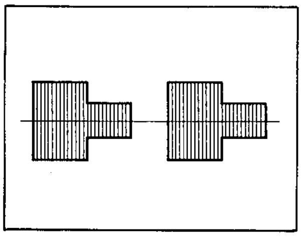
-AUDIO-

WF11
TP103
CARR DEV



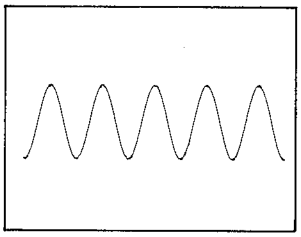
REC 0.2 Vp-p
5 mV / 5 m sec / DIV

WF12
IC101-51



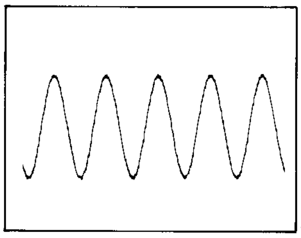
REC 0.09 Vp-p
5 mV / 5 m sec / DIV

WF1
IC301-21



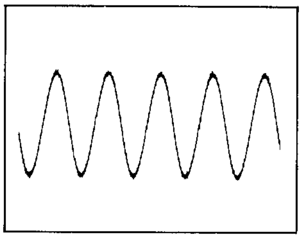
PB 0.1 Vp-p
5 mV / 5 m sec / DIV

WF2
TP301
A.OUT



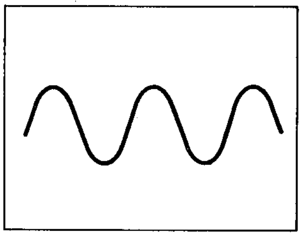
REC 1.0 Vp-p
20 mV / 0.5 m sec / DIV

WF3
IC301-20



REC 0.96 Vp-p
20 mV / 0.5 m sec / DIV

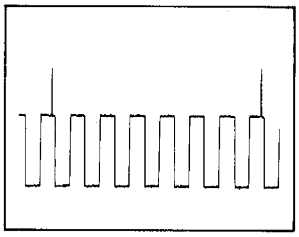
WF4
CN302-1
FE



REC 36.0 Vp-p
1v / 5 μ sec / DIV

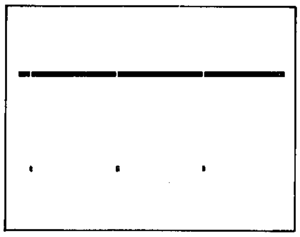
-CONTROL-

WF1
CN502-3
DM FG/PG



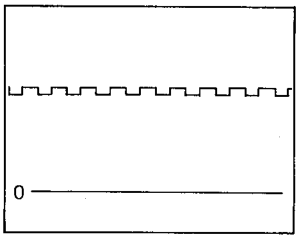
REC / PB 4.6 Vp-p
0.1V / 5 m sec / DIV

WF2
IC501-13
DPG IN



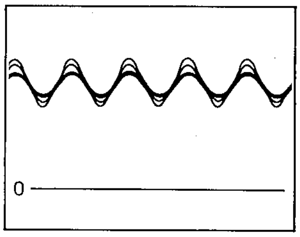
REC / PB 4.9 Vp-p
0.1V / 5 m sec / DIV

WF3
IC501-12
DFG IN



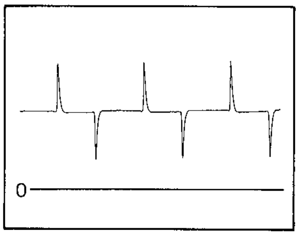
REC / PB 2.5V DC
0.1V / 5 m sec / DIV

WF4
C501-14
CFG IN



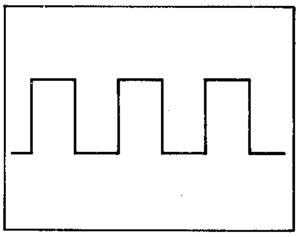
REC / PB 2.6 V DC
0.1V / 0.5 m sec / DIV

WF5
IC501-19
TP501,CTL



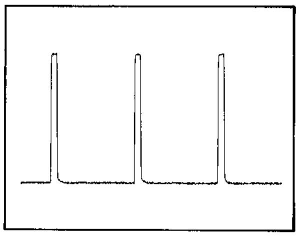
PB 2.6 V DC
0.1V / 10 m sec / DIV

WF6
IC501-38
V.SWP



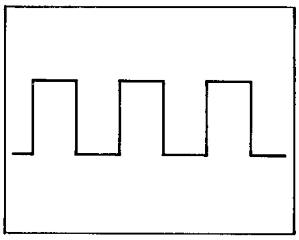
REC / PB 5.1 V p-p
0.1V / 10 m sec / DIV

WF7
IC501-78
C SYNC



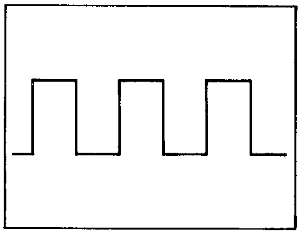
REC / PB 5.1 V p-p
0.1V / 20μ sec / DIV

WF8
IC501-44
DM PWM



REC / PB 5.1 V p-p
0.1V / 2μ sec / DIV

WF9
IC501-45
CM PWM



REC / PB 5.1 V p-p
0.1V / 2μ sec / DIV

2. PARTS LOCATION GUIDE

REF No.	LOCATION	REF No.	LOCATION	REF No.	LOCATION	REF No.	LOCATION
L105	C4	C225	B3	C308	F2	C403	A6
L106	A1	C226	B3	C309	D1	C404	A6
L107	B1	C227	B3	C310	G1	C405	A5
L108	A1	C228	A3	C311	F1	C406	A5
JA101	B1	C229	C1	C312	F1	C407	A5
Q102	C4	C230	B2	C313	F1	C408	A5
Q103	B2	C231	A3	C314	F1	C409	A5
Q104	B3	C232	A3	C315	F1	C410	A5
Q105	A1	D201	B4	C316	F1	C411	A5
Q106	A2	L201	B2	C317	E1	C412	A5
Q107	A2	L202	B1	C318	E1	C413	A5
Q108	A2	L203	C3	C319	E1	C414	B5
Q109	A1	L204	A3	C320	E2	C415	B5
TP101	B1	L205	A3	C321	E1	C416	B5
TP102	B2	L206	A3	C322	E2	C417	B4
TP103	B2	Q201	C1	C323	F1	C418	B4
TP104	C1	Q202	A2	C324	F1	C419	B5
MD101	B1	Q203	A3	C325	F2	C420	B5
R201	C1	Q204	A2	C326	E2	C421	B5
R202	C1	Q205	A4	D301	G1	C451	C5
R203	C1	Q206	A4	L301	E1	C452	B5
R204	C1	X201	A3	L302	F1	C453	B5
R205	A3	X202	A3	Q301	E1	C454	C5
R206	A3	(AUDIO)		Q302	E1	L401	C4
R207	A2	R301	E2	Q303	E1	D401	C5
R208	A2	R302	F2	Q304	G1	D402	C5
R209	A2	R303	F2	CN301	E2	D403	C5
R210	A4	R304	F2	CN302	B4	Q401	C5
R211	B3	R305	F2	IC301	F1	Q402	B5
R212	B4	R306	G1	T301	E2	Q403	B5
R213	B4	R307	G1	TP301	D1	Q404	B5
R214	A2	R308	F1	TP302	E1	CN401	A6
C201	C1	R309	F1	TP303	E1	CN402	A6
C202	C1	R310	G1	VR301	E1	CI401	A5
C203	B1	R311	F2	(KARAOKE)		CI402	A4
C204	B1	R312	F1	R401	B5	IC451	B5
C205	B3	R313	F1	R402	B5	X401	A5
C206	A2	R314	F1	R403	A5	(CONTROL)	
C207	A2	R315	E1	R404	A5	R501	E3
C208	B2	R316	F2	R405	A5	R502	E3
C209	A3	R317	F2	R406	A5	R503	E3
C210	A3	R318	E1	R407	A5	R505	E3
C211	A2	R319	E1	R408	A5	R506	E3
C212	A3	R320	E1	R409	A5	R507	E3
C213	A3	R321	F2	R410	A5	R508	E3
C214	A3	R322	E2	R411	B5	R509	F2
C215	A3	R323	F1	R412	B5	R510	F2
C216	A3	R324	F1	R413	B5	R511	E2
C217	A4	R325	E1	R414	B5	R512	E3
C218	A3	C301	E1	R415	C5	R513	F2
C219	A3	C302	E2	R451	C5	R514	F2
C220	A3	C303	F2	R452	B5	R515	E2
C221	B4	C304	F2	R453	B5	R516	F3
C222	A4	C305	F2	R454	D5	R517	E2
C223	B3	C306	F2	C401	A5	R518	E2
C224	B4	C307	F1	C402	A6	R519	E2

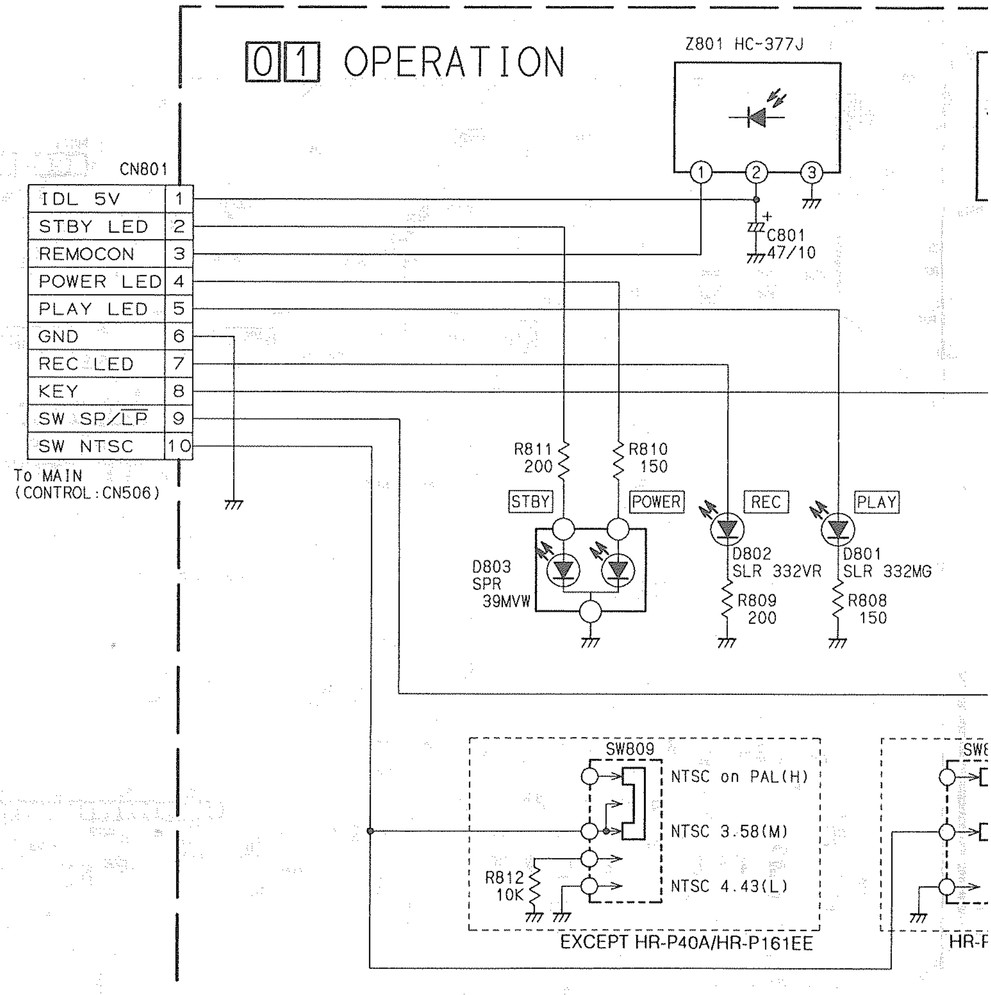
REF No.	LOCATION	R
MAIN (POWER)		
R901	H2	
R902	H3	
R903	H3	
R904	H2	
R905	H2	
R906	H2	
R907	H2	
R908	H3	
R910	H1	
R911	H3	
R912	H3	
R913	H3	
C901	H1	
C902	H1	
C903	H2	
C904	H1	
C905	G1	
C906	H3	
C907	H2	
C908	H3	
C909	H3	
D901	H2	
D902	H3	
D903	H2	
D904	H3	
Q901	H2	
L901	H1	
L902	H2	
IC901	H2	
IC902	H2	
F901	H1	
F902	H3	
CN901	H1	
T901	H3	
R951	H5	
R952	H4	
R953	H4	
R954	H5	
R955	H5	
C951	H4	
C952	H4	
C953	H4	
C954	H5	
C955	H5	
C956	H5	
C957	H5	
C958	H5	
C959	H4	
IC951	H5	
D951	H4	
D952	H5	
D953	H4	
D954	H5	
D955	H5	

REF No.	LOCATION	REF No.	LOCATION	REF No.	LOCATION
D956	H4	C36	C3	R128	A1
(PRE AMP)		C37	D3	R129	A4
R4	C3	C38	D3	R130	A3
R5	C2	D1	C2	R131	B2
R6	C2	IC1	D3	R132	A2
R7	C3	L1	C2	R133	B4
R8	C2	L2	C2	R134	B4
R9	C2	L3	C2	R135	B1
R10	C2	L4	C2	C101	B3
R11	C2	L5	D3	C102	B2
R12	C2	L6	D4	C103	B2
R13	C2	L7	D3	C104	B2
R15	C2	L8	C3	C105	B3
R16	D2	L9	C3	C106	C3
R17	C2	L10	C3	C107	B3
R18	D3	CN1	D2	C108	B2
R19	D3	TP1	C1	C109	B3
R20	D3	TP2	D1	C110	B3
R21	D3	TP3	D1	C111	B2
R22	D3	Q1	C2	C112	B2
R23	D4	Q2	C3	C113	B2
R24	D4	Q3	D3	C114	B2
R25	C3	Q4	D3	C115	B2
R26	C3	Q5	C3	C116	B3
R27	D3	Q6	D4	C117	C3
R28	D3	Q7	C3	C118	C3
R29	D3	Q9	D3	C119	B4
R30	D3	Q10	D3	C120	B3
C5	C3	Q11	D3	C121	B3
C6	C3	Q12	C4	C122	B4
C8	C2	(VIDEO)		C123	B3
C9	C2	R101	B2	C124	B4
C10	C2	R102	B3	C125	A1
C11	C2	R103	B3	C126	A1
C12	C2	R104	B2	C127	A1
C13	D3	R107	B3	C128	A1
C14	D2	R108	B2	C129	A1
C15	D2	R109	C3	C130	A2
C16	D2	R110	C3	C131	B1
C17	D2	R111	B3	C132	A4
C18	D2	R112	B3	C133	A1
C19	C2	R113	C4	C134	B3
C20	D2	R114	C1	C135	C3
C21	D2	R115	A1	C136	B1
C22	D3	R116	C1	C137	D4
C23	D3	R117	A2	C138	C4
C24	D3	R118	A2	C139	A2
C25	D4	R119	A2	D101	C4
C26	D3	R120	A2	D102	C4
C27	C3	R121	A2	D103	C4
C28	D3	R122	A2	IC101	A3
C29	D3	R123	A2	IC102	B2
C30	C3	R124	A2	L101	B2
C31	C3	R125	A1	L102	B2
C33	D3	R126	A2	L103	C3
C35	C3	R127	A1	L104	C3

REF No.	LOCATION	REF No.	LOCATION
R520	F2	C520	F4
R521	F2	C521	G3
R522	F3	C522	G3
R523	F2	C523	G2
R524	G2	C526	G4
R525	G3	C527	B4
R527	G4	D501	E2
R528	G4	D502	G4
R529	G4	D503	E4
R530	G4	L501	F2
R531	G4	L502	G4
R532	G3	L503	G3
R533	G4	Q501	E2
R534	G4	Q502	H6
R535	G5	Q503	H6
R536	G5	Q504	H6
R537	F5	Q505	H6
R538	F5	Q506	G4
R540	C5	Q507	B4
R541	F4	CN501	F5
R542	F4	CN502	G2
R543	F4	CN503	E2
R544	H6	CN504	G2
R545	H6	CN505	H6
R547	H6	VR501	H6
R548	H6	IC501	F3
R549	H6	IC502	F2
R550	E4	IC503	G3
R551	G5	TP501	E2
R552	B4	TP502	F2
R553	F5	X501	F4
R554	C5	SW501	G6
R555	G3	SW502	B6
R556	G2	PC501	F5
R557	F2	PC502	C5
R558	F2		
FR501	G4		
C501	E3		
C502	E3		
C503	E2		
C504	F2		
C505	E2		
C506	E2		
C507	F2		
C508	F2		
C509	E2		
C510	F2		
C511	F2		
C512	F2		
C513	G3		
C514	G4		
C515	G4		
C516	G4		
C517	G4		
C518	G4		
C519	F4		

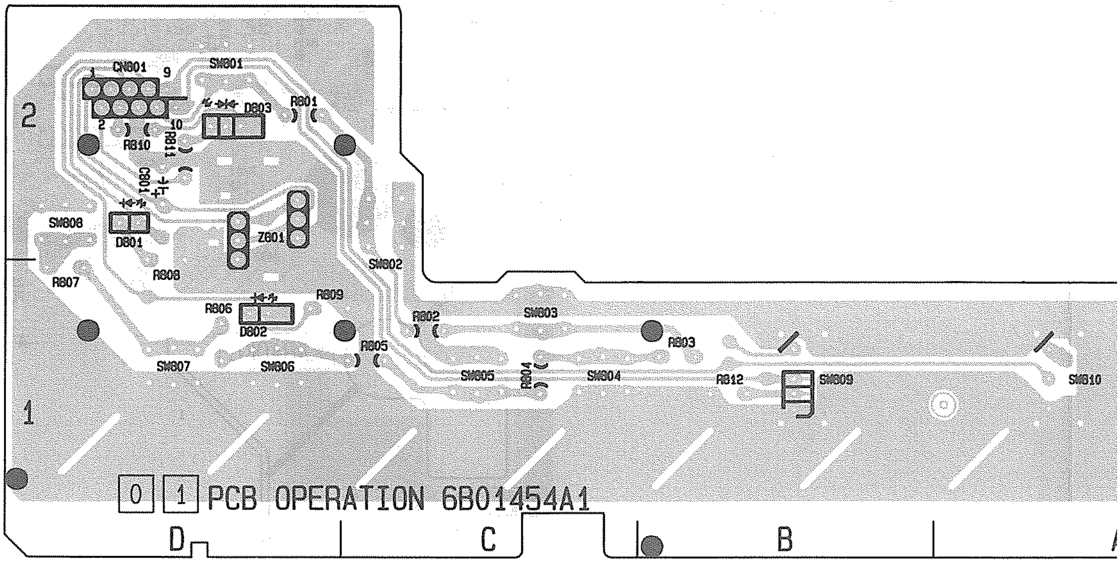
NOTE: ***When ordering parts, be sure to order according to the Part Number indicated in the Parts List.***

4.13 OPERATION SCHEMATIC DIAGRAM

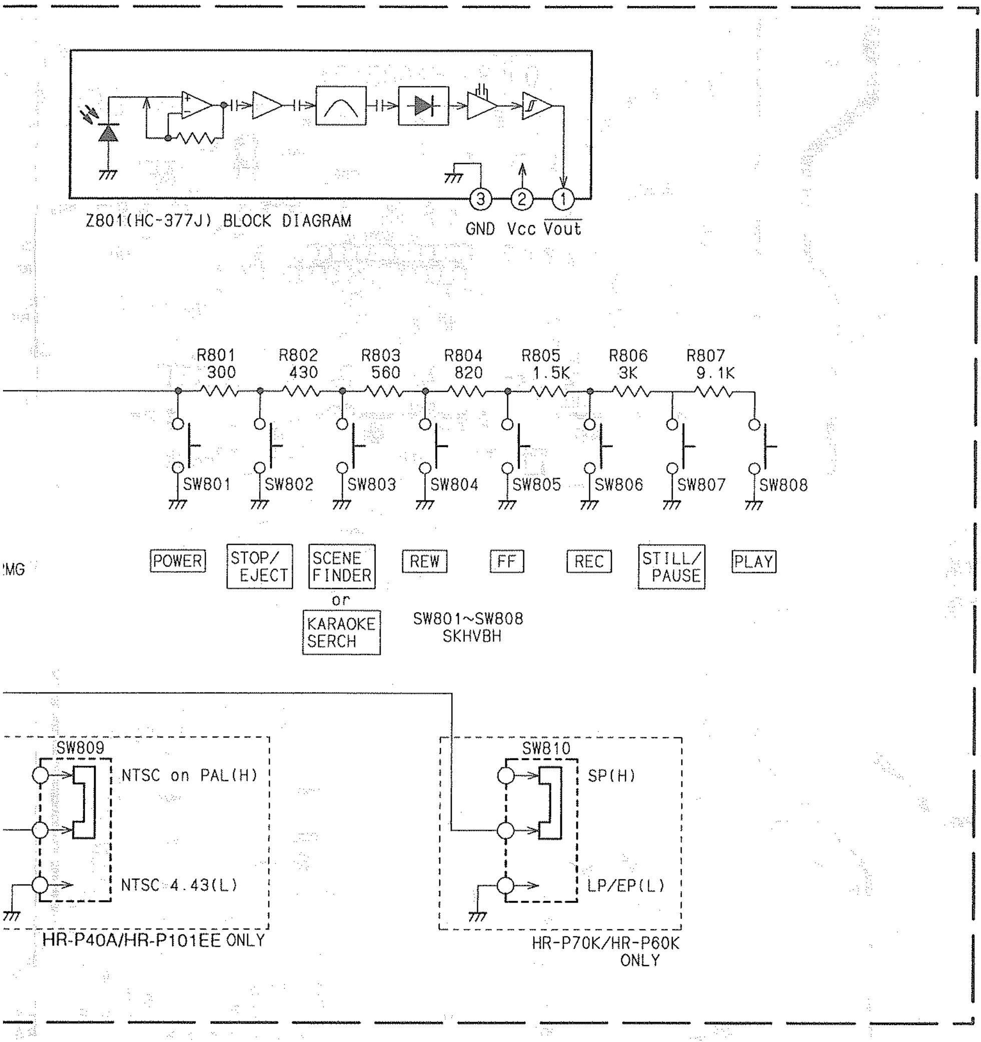


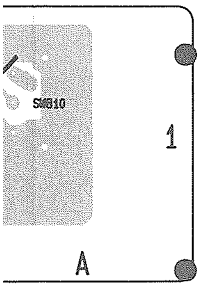
NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS
ALL ELECTROLYTIC CAPACITORS IN $\mu F/WV$

4.14 OPERATION CIRCUIT BOARD

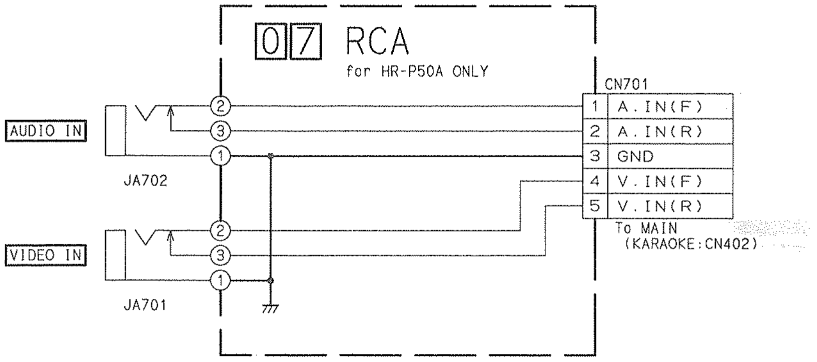


NOTE: ***When ordering parts, be sure to order according to the Part Number indicated in the Parts List.***

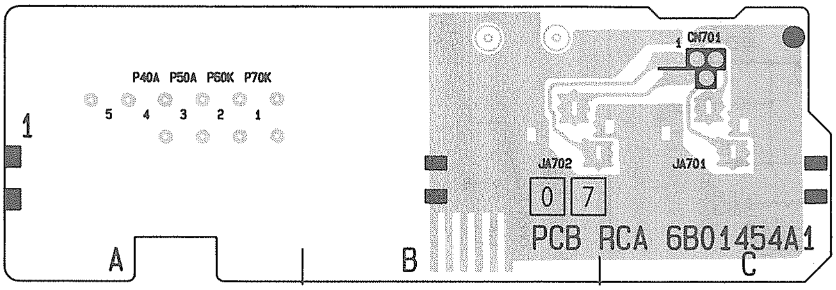




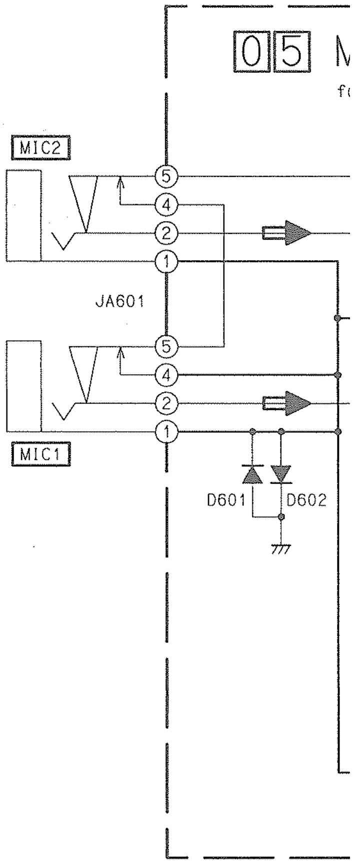
4.15 RCA SCHEMATIC DIAGRAM



4.16 RCA CIRCUIT BOARD

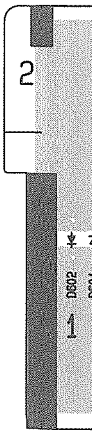


4.17 MIC SCHEMATIC

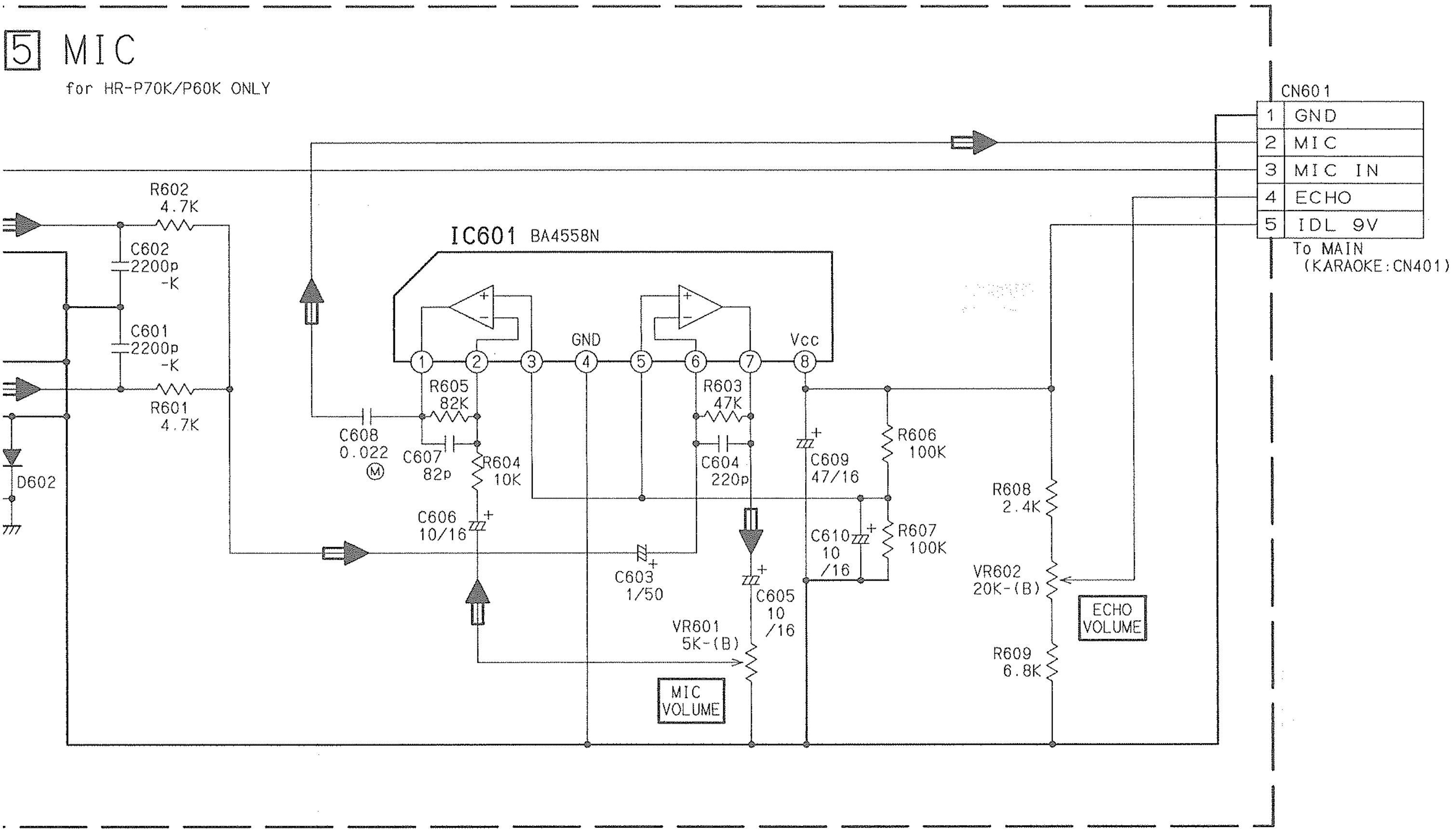


NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS
ALL CAPACITORS IN μF (p=
ALL ELECTROLYTIC CAPACITO
ALL INDUCTORS IN μH
ALL DIODES ARE 1SS120

4.18 MIC CIRCUIT



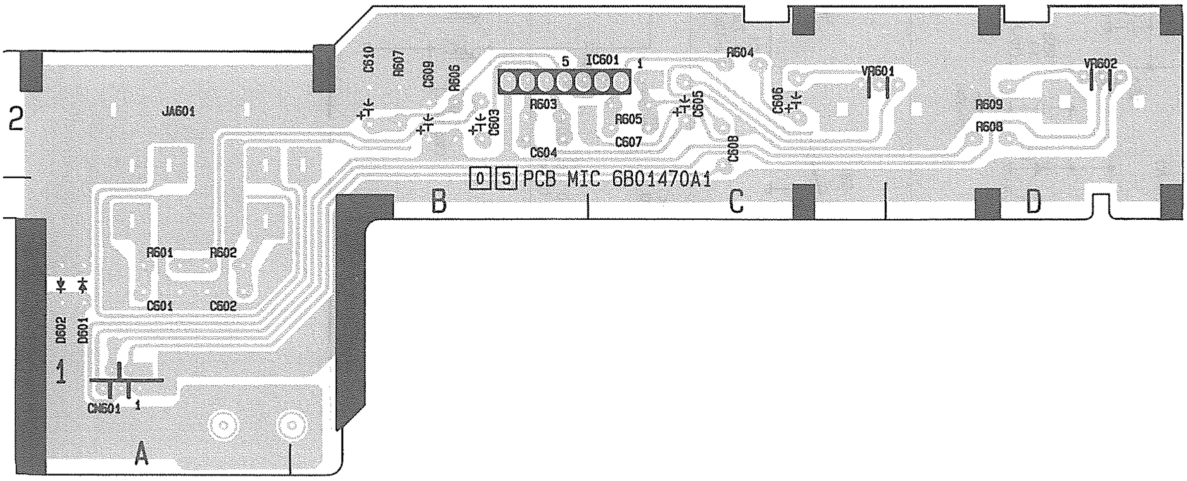
ATIC DIAGRAM



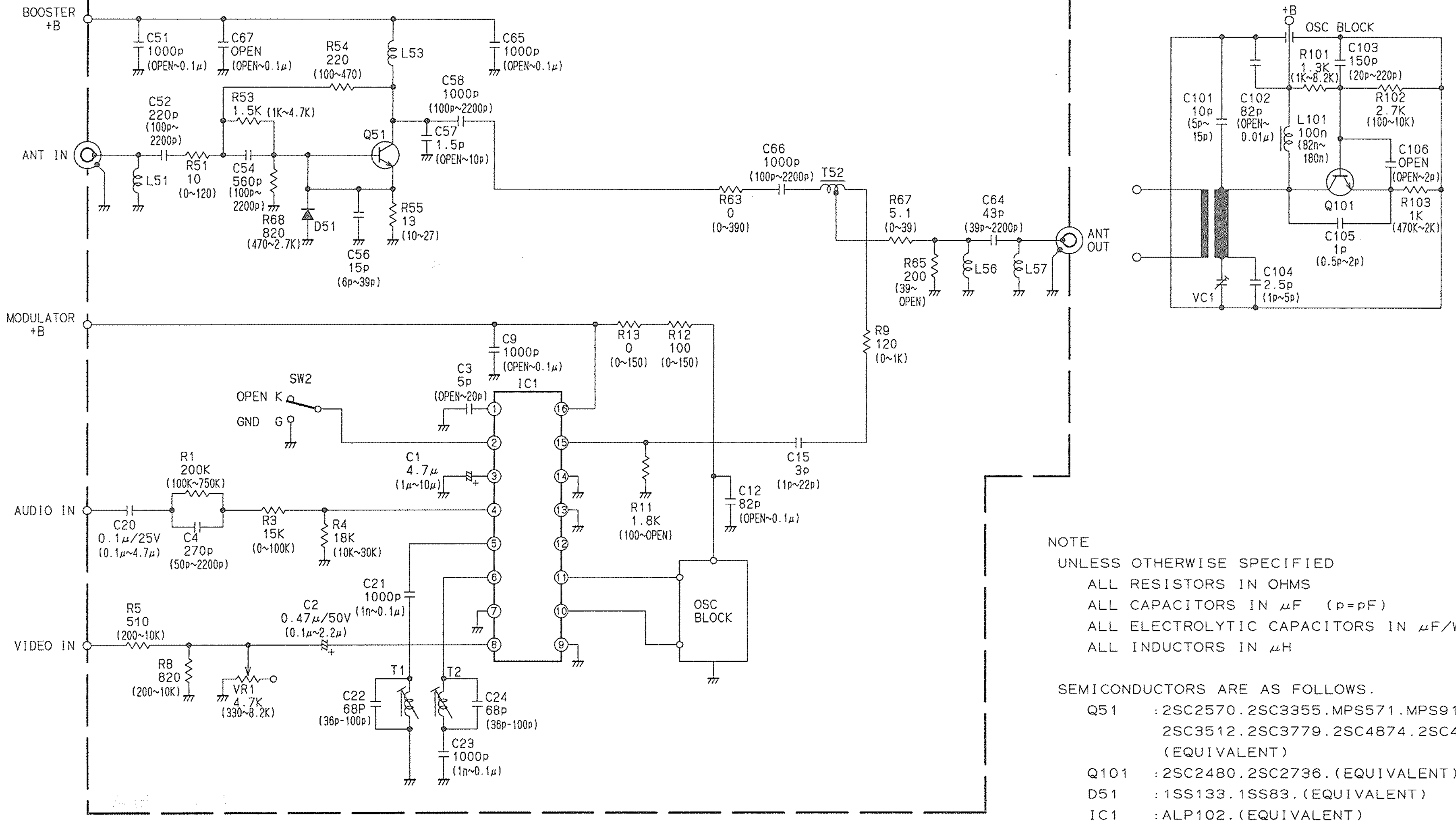
FIED
MS
F (p=pF)
PACITORS IN μF/WV

20

CUIT BOARD



4.19 RF CONVERTER SCHEMATIC DIAGRAM (For HR-P60K/P50A/P40A/P101EE)

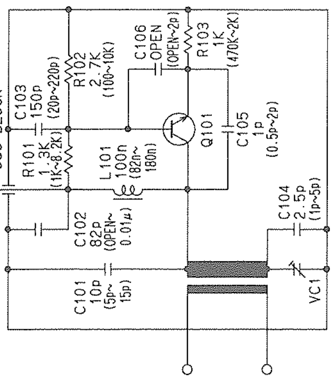


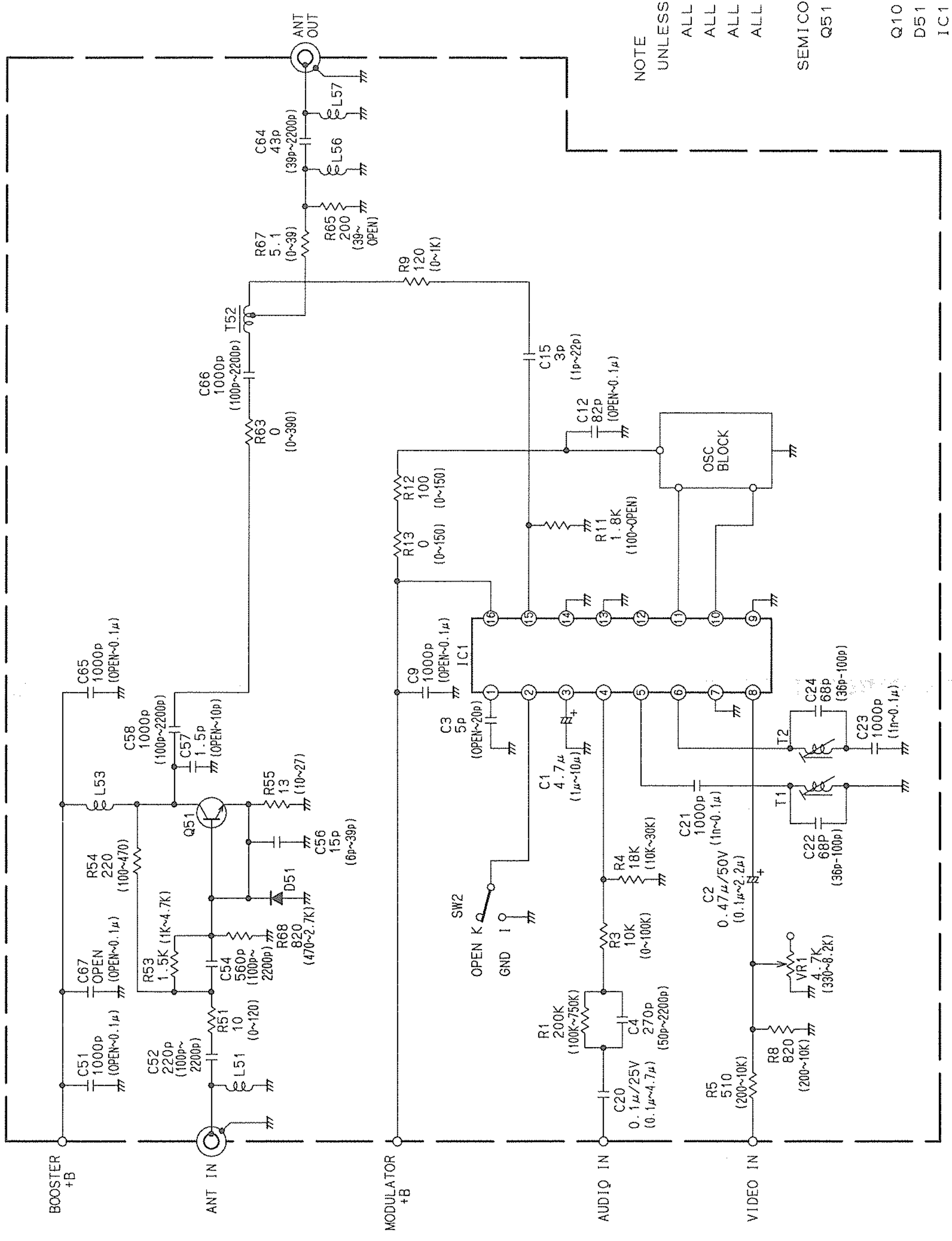
NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS
ALL CAPACITORS IN μF (p=pF)
ALL ELECTROLYTIC CAPACITORS IN μF/WV
ALL INDUCTORS IN μH

SEMICONDUCTORS ARE AS FOLLOWS.

Q51	:2SC2570.2SC3355.MPS571.MPS911. 2SC3512.2SC3779.2SC4874.2SC4875. (EQUIVALENT)
Q101	:2SC2480.2SC2736.(EQUIVALENT)
D51	:1SS133.1SS83.(EQUIVALENT)
IC1	:ALP102.(EQUIVALENT)

4.20 RF CONVERTER SCHEMATIC DIAGRAM (for HR-P70K)



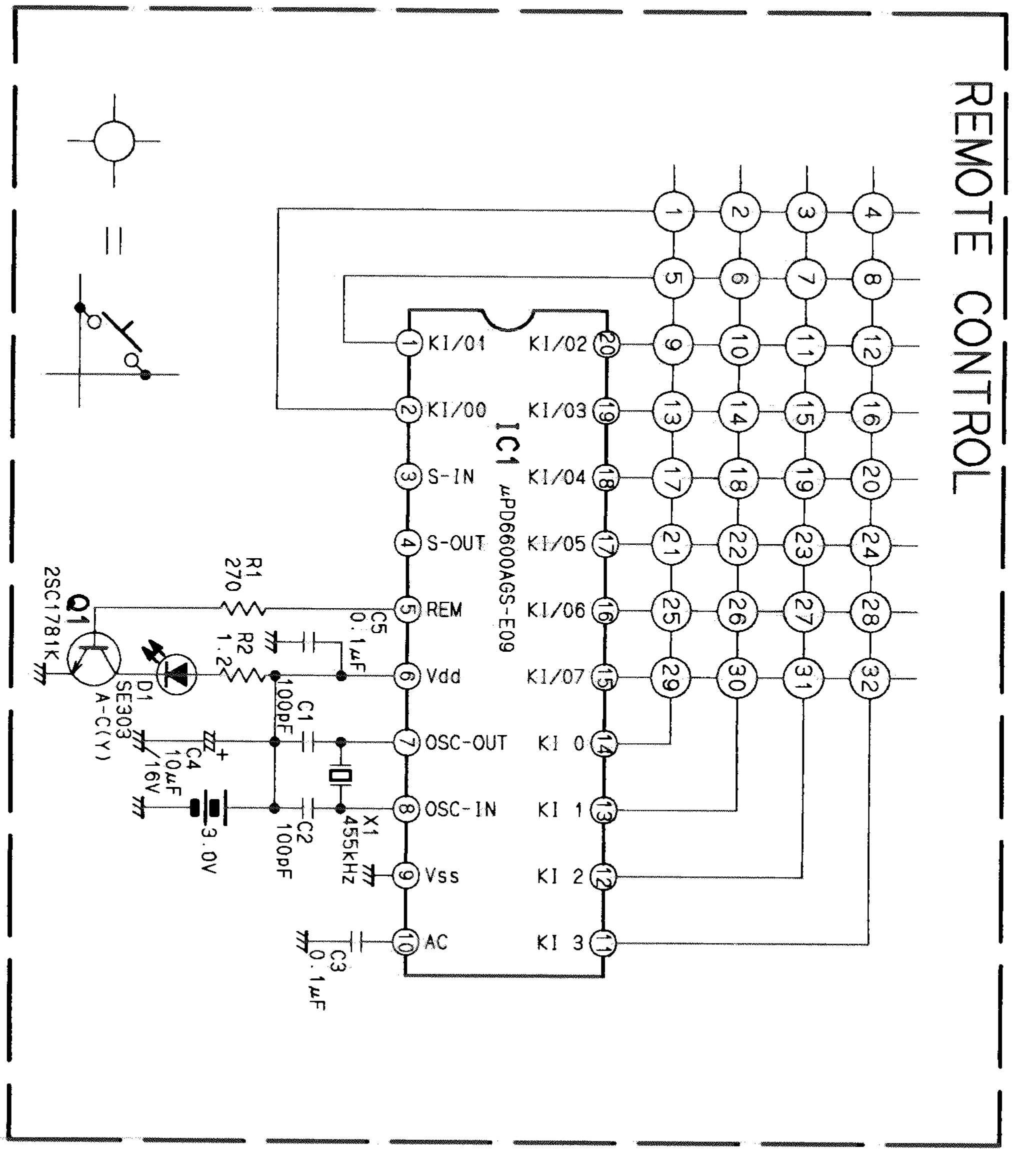


NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS
ALL CAPACITORS IN μF (p=pF)
ALL ELECTROLYTIC CAPACITORS IN μF/WV
ALL INDUCTORS IN μH

SEMICONDUCTORS ARE AS FOLLOWS.
Q51 :2SC2570.2SC3355.MPS571.MPS911.
2SC3512.2SC3779.2SC4874.2SC4875.
(EQUIVALENT)
Q101 :2SC2480.2SC2736.(EQUIVALENT)
D51 :1SS133.1SS83.(EQUIVALENT)
IC1 :ALP102.(EQUIVALENT)

4.21 REMOTE CONTROL SCHEMATIC DIAGRAM

KEY No.	FUNCTION NAME	
1	VIDEO	OPERATE
2		STOP
3		FF
4		REW
5		PLAY
6		REC
7		PAUSE/STILL
8		TV/VIDEO
9	TV	TV OPERATE
10		TV/VIDEO
11	VIDEO	TRACKING +
12		TRACKING -
13	TV	TV CH +
14		TV CH -
15		VOLUME +
16		VOLUME -
17	VIDEO	AUTO



4.22 VOLTAGE CHARTS

BLOCK	REF. No.	POINT	PB(V)	REC(V)	BLOCK	REF. No.	POINT	PB(V)	REC(V)
PRE AMP	IC1	1pin	2.6	2.6		CN1	1pin	0.0	2.4
		2pin	2.9	3.6			2pin	0.0	2.4
		3pin	2.3	2.4			3pin	0.0	2.4
		4pin	0.0	←			4pin	0.0	2.4
		5pin	0.7	2.2					
		6pin	0.0	←					
		7pin	0.7	2.2					
		8pin	0.0	←					
		9pin	0.0	2.4					
		10pin	1.2	←					
		11pin	5.1	0.6					
		12pin	5.1	←					
		13pin	2.9	←					
		14pin	0.0	←					
		15pin	3.2	0.0					
		16pin	2.8	4.4					
		17pin	0.0	←					
		18pin	0.7	0.0					
		19pin	2.6	3.3					
		20pin	0.0	←					
		21pin	3.1	3.0					
		22pin	0.0	←					
	Q1	B	0.8	←					
		C	4.5	4.4					
		E	0.2	←					
	Q2	B	5.1	5.0					
		C	5.1	5.0					
		E	4.4	4.3					
	Q3	B	2.6	3.3					
		C	3.2	2.7					
		E	1.9	2.7					
	Q4	B	1.9	2.6					
		C	4.5	4.1					
		E	1.3	2.0					
	Q5	B	4.5	4.1					
		C	5.2	←					
		E	3.8	5.1					
	Q6	B	0.0	←					
		C	0.0	←					
		E	0.0	←					
	Q7	B	2.8	4.4					
		C	5.1	5.0					
		E	2.2	3.7					
	Q12	B	5.1	0.2					
		C	3.8	5.1					
		E	5.2	5.2					

BLOCK	REF. No.	POINT	PB(V)	REC(V)	BLOCK	REF. No.	POINT	PB(V)	REC(V)
VIDEO	IC101	1pin	2.2	←	VIDEO	IC101	51pin	2.0	←
		2pin	0.1	←			52pin	3.5	←
		3pin	3.4	←			53pin	5.0	←
		4pin	2.3	2.2			54pin	3.0	←
		5pin	2.2	←			55pin	2.7	←
		6pin	1.3	←			56pin	2.7	←
		7pin	4.6	←					
		8pin	4.8	←		IC102	1pin	1.9	←
		9pin	3.0	←			2pin	3.9	←
		10pin	2.9	←			3pin	5.2	←
		11pin	0.0	←			4pin	0.0	←
		12pin	2.1	←			5pin	5.2	←
		13pin	0.3	2.7			6pin	3.7	←
		14pin	0.1	←			7pin	2.1	←
		15pin	4.8	4.9			8pin	2.0	←
		16pin	2.0	←			9pin	0.0	←
		17pin	2.8	←			10pin	0.0	←
		18pin	0.4	←			11pin	2.7	←
		19pin	5.1	←			12pin	0.0	←
		20pin	2.4	←			13pin	--	←
		21pin	2.8	←			14pin	1.6	←
		22pin	3.1	←					
		23pin	2.8	2.9		Q103	B	3.7	←
		24pin	3.1	←			C	5.2	←
		25pin	1.9	2.1			E	3.1	3.2
		26pin	0.6	←		Q104	B	1.5	1.6
		27pin	1.4	←			C	0.0	←
		28pin	3.1	←			E	2.2	←
		29pin	2.4	←		Q105	B	4.4	←
		30pin	0.0	←			C	5.0	←
		31pin	3.1	←			E	5.2	5.1
		32pin	2.2	←		Q106	B	3.9	←
		33pin	1.7	←			C	0.0	←
		34pin	2.1	3.1			E	2.9	2.8
		35pin	1.5	1.4		Q107	B	2.2	2.1
		36pin	0.7	1.1			C	0.0	←
		37pin	2.8	←			E	2.9	2.8
		38pin	0.0	←		Q108	B	3.3	←
		39pin	1.9	2.4			C	6.3	←
		40pin	1.5	1.9			E	2.7	2.6
		41pin	1.5	1.9		Q109	B	2.6	←
		42pin	0.0	←			C	9.0	←
		43pin	1.9	2.3			E	2.0	←
		44pin	2.8	1.1		Q110	B	0.0	←
		45pin	3.6	3.0			C	5.0	5.0
		46pin	2.1	←			E	0.0	←
		47pin	5.0	←					
		48pin	2.7	←					
		49pin	3.9	←					
		50pin	2.6	←					

BLOCK	REF. No.	POINT	PB(V)	REC(V)
VIDEO	Q201	B	5.0	5.0
		C	0.0	←
		E	0.0	←
	Q202	B	0.4	←
		C	0.0	←
		E	1.0	←
	Q203	B	0.0	←
		C	0.0	←
		E	0.0	←
	MD101 (RF-CONV)	1pin	0.0	←
		2pin	0.0	←
		3pin	5.0	←
		4pin	0.0	←
		5pin	5.0	←
AUDIO	IC301	1pin	0.0	8.1
		2pin	0.0	4.0
		3pin	0.0	←
		4pin	0.0	15.1
		5pin	7.9	←
		6pin	9.0	←
		7pin	0.0	←
		8pin	9.1	←
		9pin	0.0	←
		10pin	5.0	0.0
		11pin	0.0	←
		12pin	0.0	←
		13pin	0.0	←
		14pin	0.0	←
		15pin	2.1	←
		16pin	0.0	←
		17pin	2.3	←
		18pin	0.0	←
		19pin	0.0	←
		20pin	3.8	←
		21pin	2.4	←
		22pin	1.3	←
		23pin	0.0	←
		24pin	0.0	←
		25pin	0.0	←
		26pin	0.0	←
		27pin	0.3	←
		28pin	0.0	←
		29pin	0.0	←
		30pin	4.0	←
	Q301	B	5.0	0.0
		C	0.0	←
		E	0.0	←
	Q302	B	0.0	0.9
		C	0.0	9.0
		E	0.0	0.2
	Q303	B	5.0	0.1
		C	0.0	5.1
		E	5.2	5.1
	Q304	B	0.0	←
		C	0.0	←
		E	0.0	←
	CN301	1pin	2.5	--
		2pin	2.5	--
		3pin	0.0	←
		4pin	0.0	←
		5pin	0.0	15.1
		6pin	0.0	←
		7pin	0.0	←
	CN301	1pin	0.0	←
		2pin	0.0	←

BLOCK	REF. No.	POINT	PB(V)	REC(V)	BLOCK	REF. No.	POINT	PB(V)	REC(V)
KARAOKE	IC401	1pin	4.1	←	KARAOKE	IC451	1pin	1.9	←
		2pin	3.9	←			2pin	6.9	←
		3pin	0.0	←			3pin	2.0	←
		4pin	0.0	←			4pin	0.0	←
		5pin	0.0	←			5pin	0.0	←
		6pin	7.2	←			6pin	5.1	←
		7pin	4.1	←			7pin	4.6	←
		8pin	0.4	←			8pin	3.7	←
		9pin	4.2	←			9pin	9.1	←
		10pin	4.1	←					
		11pin	4.2	←		Q401	B	0.0	←
		12pin	3.7	←			C	5.1	←
		13pin	4.1	←			E	5.1	←
		14pin	4.0	←		Q402	B	5.1	←
		15pin	4.1	←			C	0.0	←
		16pin	0.5	←			E	0.0	←
		17pin	3.9	←		Q403	B	4.9	←
		18pin	8.9	←			C	0.0	←
		19pin	9.1	←			E	4.8	←
		20pin	0.0	←		Q404	B	0.0	←
		21pin	4.2	←			C	0.0	←
		22pin	4.2	←			E	0.0	←
	IC402	1pin	2.5	←		CN401	1pin	9.1	←
		2pin	2.5	←			2pin	0.0	←
		3pin	0.0	←			3pin	0.0	←
		4pin	2.5	←			4pin	4.2	←
		5pin	5.1	←			5pin	0.0	←
		6pin	5.1	←		CN402	1pin	0.0	←
		7pin	5.1	←			2pin	0.0	←
		8pin	5.1	←			3pin	0.0	←
		9pin	0.0	←			4pin	0.0	←
		10pin	2.4	←			5pin	0.0	←
		11pin	2.2	←					
		12pin	0.0	←					
		13pin	0.0	←					
		14pin	0.0	←					
		15pin	0.0	←					
		16pin	0.0	←					
		17pin	0.0	←					
		18pin	5.1	←					

BLOCK	REF. No.	POINT	PB(V)	REC(V)
CONTROL	IC501	1pin	0.0	←
		2pin	2.6	←
		3pin	5.0	←
		4pin	5.2	←
		5pin	0.0	←
		6pin	3.2	←
		7pin	5.0	4.9
		8pin	5.2	←
		9pin	5.2	←
		10pin	5.2	←
		11pin	2.5	←
		12pin	2.5	←
		13pin	4.9	←
		14pin	2.6	←
		15pin	2.2	←
		16pin	0.0	←
		17pin	2.6	←
		18pin	2.6	←
		19pin	2.6	←
		20pin	2.5	--
		21pin	2.5	--
		22pin	5.2	←
		23pin	2.9	←
		24pin	0.0	←
		25pin	0.1	5.1
		26pin	0.1	←
		27pin	5.2	←
		28pin	0.0	←
		29pin	5.2	←
		30pin	5.1	0.2
		31pin	0.1	←
		32pin	5.1	0.1
		33pin	4.8	←
		34pin	0.4	5.1
		35pin	0.1	←
		36pin	0.1	←
		37pin	0.3	←
		38pin	--	--
		39pin	--	--
		40pin	--	--
		41pin	--	--
		42pin	0.1	←
		43pin	5.1	←
		44pin	2.4	←
		45pin	2.7	←
		46pin	2.6	←
		47pin	0.0	←
		48pin	2.1	←
		49pin	5.2	←
		50pin	5.2	←
CONTROL	IC501	51pin	0.0	←
		52pin	5.2	←
		53pin	0.0	←
		54pin	--	--
		55pin	--	--
		56pin	5.2	←
		57pin	5.2	←
		58pin	0.1	←
		59pin	5.1	←
		60pin	0.3	5.1
		61pin	5.1	0.3
		62pin	2.1	0.6
		63pin	1.9	1.9
		64pin	0.0	←
		65pin	--	--
		66pin	0.0	←
		67pin	0.0	←
		68pin	0.0	←
		69pin	0.0	←
		70pin	0.0	←
		71pin	0.0	4.9
		72pin	5.1	←
		73pin	5.2	←
		74pin	0.0	←
		75pin	4.7	←
		76pin	4.7	←
		77pin	0.0	←
		78pin	0.4	←
		79pin	--	--
		80pin	--	--
	IC502	1pin	5.2	←
		2pin	0.0	←
		3pin	2.9	←
	IC503	1pin	0.1	←
		2pin	12.3	←
		3pin	0.0	←
		4pin	0.0	←
		5pin	0.0	←
		6pin	12.3	←
		7pin	0.0	←
		8pin	12.3	←
		9pin	0.1	←

BLOCK	REF. No.	POINT	PB(V)	REC(V)
CONTROL	Q501	B	1.5	←
		C	4.9	←
		E	0.0	←
	Q502	B	5.1	0.3
		C	0.0	5.1
		E	5.2	←
	Q503	B	0.3	5.1
		C	5.1	0.0
		E	5.2	←
	Q504	B	0.3	←
		C	5.1	←
		E	5.2	←
	Q505	B	5.1	←
		C	0.0	←
		E	5.2	←
	Q506	C	4.9	←
		E	0.0	←
	Q507	C	4.9	←
		E	0.0	←
	CN501	1pin	0.0	←
		2pin	5.2	←
		3pin	5.2	←
		4pin	0.0	←
		5pin	0.0	←
	CN502	1pin	12.3	←
		2pin	0.0	←
		3pin	1.5	←
		4pin	1.5	←
	CN503	1pin	2.6	←
		2pin	5.2	←
		3pin	5.1	←
		4pin	2.4	←
		5pin	12.3	←
		6pin	0.0	←
		7pin	--	--
		8pin	0.0	←
	CN504	1pin	0.0	←
		2pin	0.0	←
	CN505	1pin	5.2	←
		2pin	5.2	←
		3pin	5.2	←
		4pin	0.0	5.1
		5pin	0.0	←
		6pin	5.1	0.0
		7pin	5.1	←
		8pin	5.2	←
		9pin	0.0	←
		10pin	5.2	←

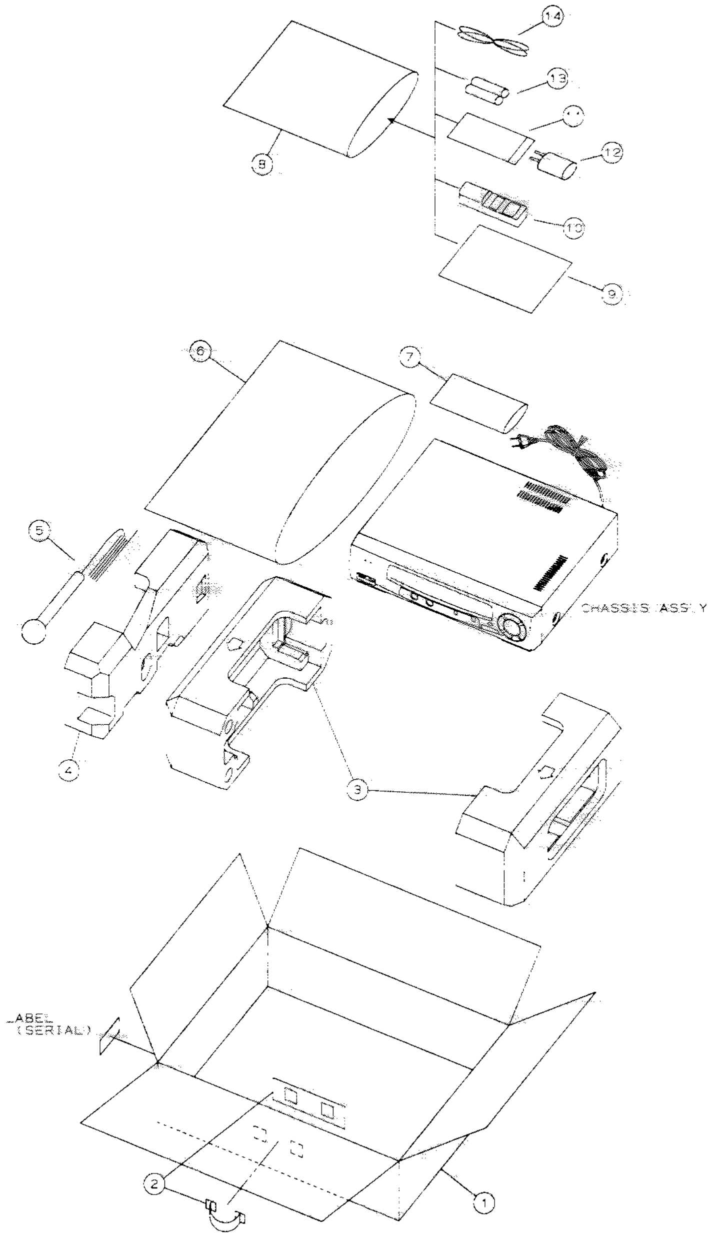
BLOCK	REF. No.	POINT	PB(V)	REC(V)
MIC	IC601	1pin	4.6	←
		2pin	4.6	←
		3pin	4.6	←
		4pin	0.0	←
		5pin	4.6	←
		6pin	4.6	←
		7pin	4.6	←
		8pin	9.1	←
OPERATION	Z801	1pin	5.2	←
		2pin	5.2	←
		3pin	0.0	←
POWER	IC901	1pin	490	←
		2pin	490	←
		3pin	-0.3	←
		4pin	0.0	←
		5pin	-2.2	←
		6pin	0.6	←
		7pin	0.2	←
	IC902	1pin	-6.3	←
		2pin	-8.9	←
		3pin	6.8	←
	IC951	1pin	0.0	←
		2pin	6.9	←
		3pin	5.2	←
		4pin	9.1	←
		5pin	10.2	←
		6pin	12.9	←
		7pin	12.2	←
		8pin	13.5	←
		9pin	14.5	←
		10pin	0.0	←
	Q901	B	6.8	6.5
		C	0.6	←
		E	7.3	7.0

SECTION 5
PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

5.1 PACKING AND ACCESSORY ASSEMBLY <M1>



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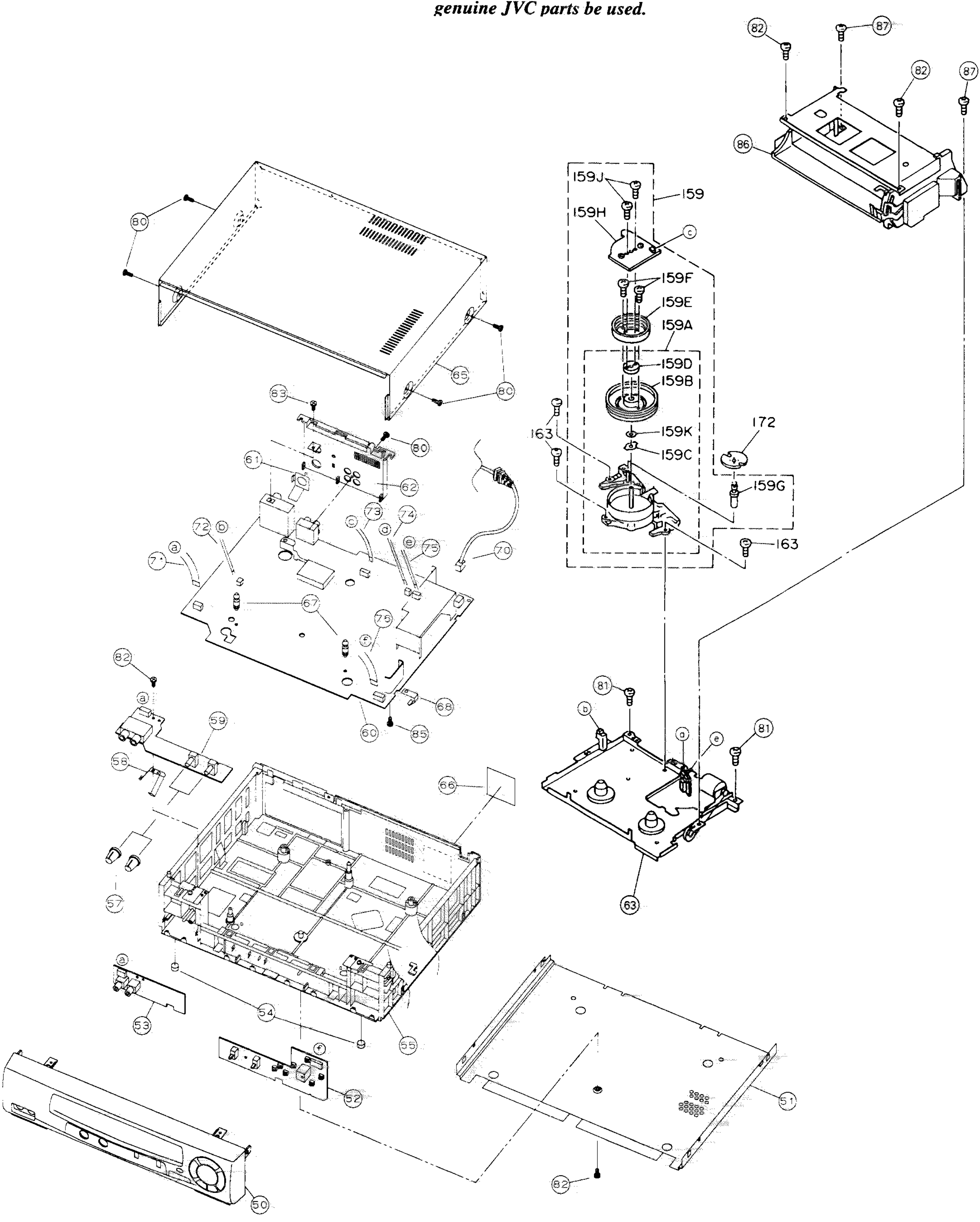
PACKING AND ACCESSORY ASSEMBLY <M1>

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	1	PZ06D04045A1	PACKING CASE HR-P70K
		PZ06D04045A2	PACKING CASE HR-P60K
		PZ06D04045A3	PACKING CASE HR-P50A
		PZ06D04045A4	PACKING CASE HR-P40A
		PZ06D04045A5	PACKING CASE HR-P101EE
	2	PZ01F51629A1	HANDLE
	3	PZ06B01473A1	CUSION ASSEMBLY
	4	PZ06D04046A1	CUSION SUB ASSY HR-P70K P60K
	5	PZ06U90540A1	MICROPHONE HR-P70K P60K
	6	PZ06D04035A1	POLY BAG
	7	PZ06D01120A1	POLY BAG,POWER CORD
	8	PZ06D01149A1	POLY BAG,DOCUMENT
⚠	9	PU30425-1598	INSTRUCTIONS HR-P40A
⚠		PU30425-1599	INSTRUCTIONS HR-P50A
⚠		PU30425-1600	INSTRUCTIONS HR-P60K
⚠		PU30425-1601	INSTRUCTIONS HR-P70K
⚠		PU30425-1748	INSTRUCTIONS HR-P101EE
⚠	10	PZ08N39849A1	REMOTE CONTROL UNIT
	11	PZ08R08712A1	POLY BAG,CONVERSION PLUG HR-P50A P40A P101EE
⚠	12	PZ06D02754A1	CONVERSION PLUG HR-P50A P40A P101EE
	13	PZ00R39879A2	BATTERY,X2
	14	PZ00N09891A1	RF CABLE

5.2 CABINET AND CHASSIS ASSEMBLY <M2>

BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.



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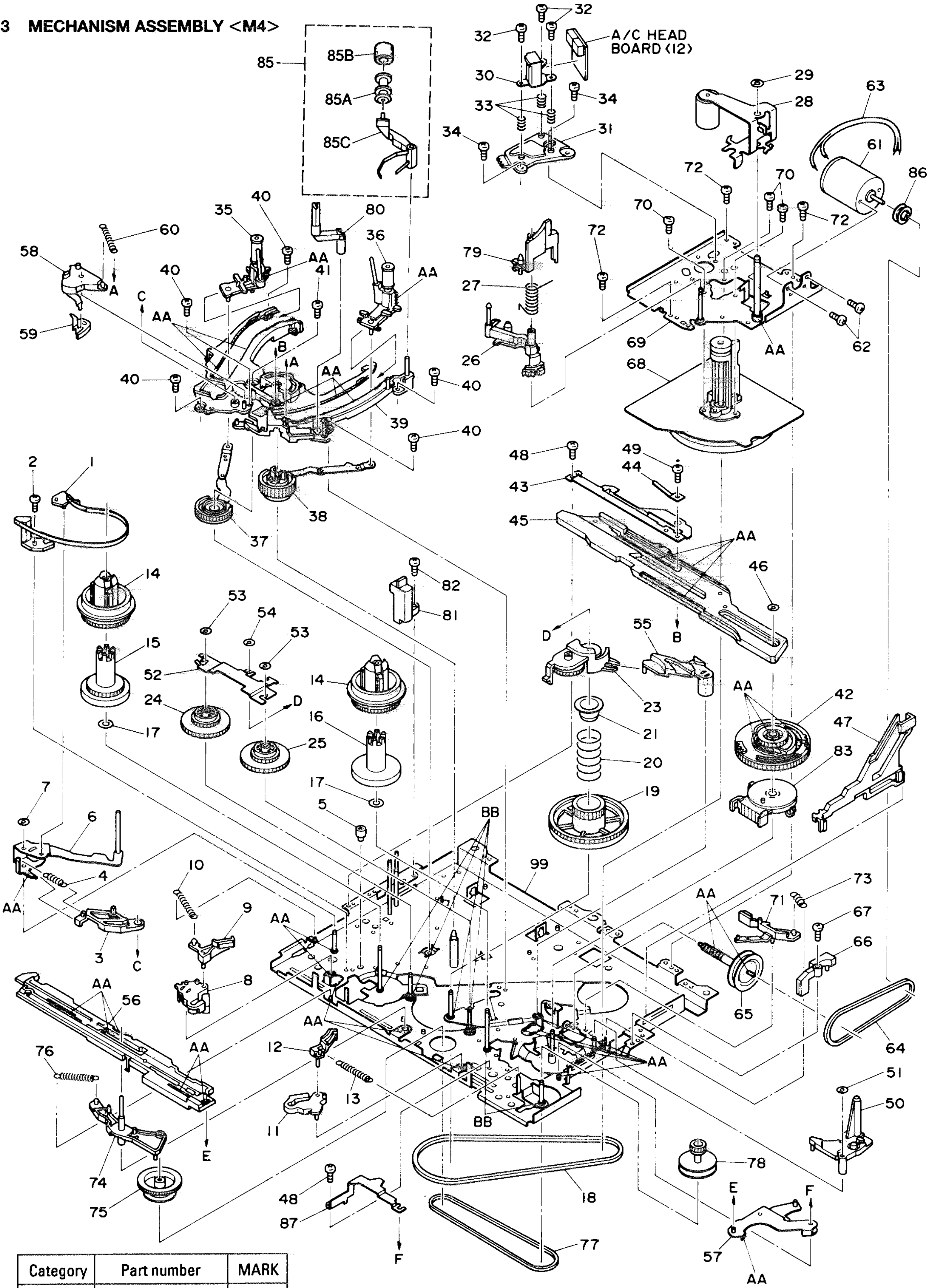
CABINET AND CHASSIS ASSEMBLY <M2>

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
⚠	50	PZ06B01472A1	FRONT PANEL ASSEMBLY HR-P70K
⚠		PZ06B01472A2	FRONT PANEL ASSEMBLY HR-P60K
⚠		PZ06B01472A3	FRONT PANEL ASSEMBLY HR-P50A
⚠		PZ06B01472A4	FRONT PANEL ASSEMBLY HR-P40A
⚠		PZ06B01472A5	FRONT PANEL ASSEMBLY HR-P101EE
⚠	51	PZ06A00541A1	BOTTOM COVER
	52	—	OPERATION BOARD ASSEMBLY REFER TO 01
	53	—	RCA BOARD ASSEMBLY REFER TO 07
	54	PZ06D03223A1	FOOT,X2
⚠	55	PZ06A00540A1	BOTTOM CHASSIS
	57	PZ06C03392A1	KNOB,X2 HR-P70K P60K
	58	PZ06D04067A1	SPRING HR-P70K P60K P50A
	59	—	MIC BOARD ASSEMBLY REFER TO 05
	60	—	MAIN BOARD ASSEMBLY REFER TO 03
	61	PZ06D03466B1	SPRING
	62	PZ06B01455A1	REAR PANEL HR-P70K
		PZ06B01455A2	REAR PANEL HR-P60K P50A P40A P101EE
	63	—	MECHANISM ASSEMBLY REFER TO M4
	64	PZ06D03987A1	SHIELD CASE
⚠	65	PZ06A00542A1	TOP COVER HR-P70K P50A P101EE
⚠		PZ06A00542A2	TOP COVER HR-P60K P40A
⚠	66	—	RATING LABEL
	67	PEME0947-01-01	SPACER,X2
	68	PZ06D04106A1	SPRING
⚠	70	PZ06D04097A1	AC POWER CORD ASSY
	71	PZ06D04071A1	WIRE,MIC HR-P70K P60K
		PZ06D04071A2	WIRE,MIC HR-P50A
	72	PZ06D03477A1	WIRE,FE
	73	PZ06D03482A2	WIRE,DRUM
	74	PZ06D03478A2	WIRE,CTL
	75	PZ06D03479A2	WIRE,AUDIO
	76	PZ06D02859A2	WIRE,OPERATION
	80	PZ0FJ923010X	TAPPING SCREW,X5 3X10
	81	PZ0FJ924010D	TAPPING SCREW,X2 4X10
	82	PZ0FJ763009D	TAPPING SCREW,X5 3X9
	83	PZ0FF793005D	SCREW 3X5
	84	PZ0FR872608D	TAPPING SCREW 2.6X8
	85	PZ0FR913008D	TAPPING SCREW 3X8
	86	PUS29724B-2	CASSETTE HOUSING ASSY
	87	SPST2612ZY	TAPPING SCREW,X2 2.6X12
	159	PDV2350A	DRUM FINAL ASSY HR-P70K P60K
		PDV2349A	DRUM FINAL ASSY HR-P50A P40A P101EE
	159A	PDM2261E	DRUM SUB ASSY HR-P70K P60K
		PDM2261K	DRUM SUB ASSY HR-P50A P40A P101EE
	159B	PDM3353G-14	UPPER DRUM ASSY HR-P70K P60K
		PDM3353L-14	UPPER DRUM ASSY HR-P50A P40A P101EE
	159C	PDM4400A-2	BRUSH ASSEMBLY HR-P70K P60K
		PDM4400A	BRUSH ASSEMBLY HR-P50A P40A P101EE
	159D	PDM4345A	COLLAR ASSEMBLY
	159E	PDZ0141-2	ROTOR ASSEMBLY
	159F	SPSH2660Z	SCREW,X2 2.6X6
	159G	PDM4311A-1	ROLLER ASSEMBLY
⚠	159H	PDZ0141-1-2	STATOR ASSEMBLY
	159J	SPSP2606Z	SCREW,X2 2.6X6
	159K	PDM4050-9	WASHER
	163	SPST2608Z	SCREW,X3 2.6X8
	172	PQ44230	INERTIA PLATE

5.3 MECHANISM ASSEMBLY <M4>



Category	Part number	MARK
Grease	KYODO-SH-P	AA
Oil	COSMO-HV56	BB

NOTE: The section marked in AA and BB indicate lubrication and greasing areas.

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MECHANISM ASSEMBLY <M4>

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	1	PQ46298A-3	TENSION BAND ASSEMBLY
	2	SDST2608Z	SCREW
	3	PQ35012	TENSION ARM LEVER
	4	PQM30001-385	TENSION SPRING
	5	PQ46302	ADJUST PIN
	6	PQ46303A-1	TENSION ARM ASSEMBLY
	7	PQM30017-47	SLIT WASHER
	8	PQ46305A-1	MAIN BRAKE ASSEMBLY(SUPPLY)
	9	PQ46306A-3	SUB BRAKE ASSEMBLY(SUPPLY)
	10	PQM30001-393	TENSION SPRING
	11	PQ46308A-2	MAIN BRAKE ASSEMBLY(TAKE UP)
	12	PQ46309A-4	SUB BRAKE ASSEMBLY(TAKE UP)
	13	PQM30001-389102	TENSION SPRING
	14	PQ21683-1-3	REEL DISK,X2
	15	PQ35014-1-1	SLIT DISK(SUPPLY)
	16	PQ35015-1-1	SLIT DISK(TAKE UP)
	17	PQM30018-69	SPECER,X2
	18	PQM30003-33	BELT(CAPSTAN)
	19	PQ35016-1-3	PULLEY
	20	PQM30002-227-22	COMPRESSION SPRING
	21	PQ46311	SPRING CAP
	23	PQ46312B	IDLER ARM ASSEMNLY
	24	PQ46316A-1	CLUTCH UNIT(SUPPLY)
	25	PQ46323A-1	CLUTCH UNIT(TAKE UP)
	26	PQ46325A-6	GUIDE ARM ASSEMBLY
	27	PQ46326-1-2	TORSION SPRING
	28	PQ46327A	PINCH ROLLER ARM ASSEMBLY
	29	PQM30017-24	SLIT WASHER
	30	PEHE0182	AUDIO/CONTROL HEAD
	31	PQ35206	HEAD BASE
	32	PQ43687A	SPECIAL SCREW,X3
	33	PQM30002-192	COMPRESSION SPRING,X3
	34	SDST2604Z	SCREW,X2
	35	PQ46330A	POLE BASE ASSY(SUPPLY)
	36	PQ46331A	POLE BASE ASSY(TAKE UP)
	37	PQ46332A-2	LOADING ARM ASSY(SUPPLY)
	38	PQ46337A-3	LOADING ARM ASSY(TAKE UP)
	39	PQ11657-1-5	GUIDE RAIL
	40	SPST2608Z	SCREW,X5
	41	SDST2612Z	SCREW
	42	PQ21684-1-3	CONTROL CAM
	43	PQ35138-1-2	CONTROL BRACKET
	44	PQ46423	EARTH PLATE

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	45	PQ11658-1-5	CONTROL PLATE
	46	PQM30017-8	SLIT WASHER
	47	PQ21685-2-6	PINCH PLATE
	48	SPST2606Z	SCREW,X2
	49	SPSF2608M	SCREW
	50	PQ46342A-6	LEVER ASSY
	51	PQM30017-8	SLIT WASHER
	52	PQ35083-1-2	REEL BRACKET
	53	PQM30017-50	SLIT WASHER,X2
	54	Q03093-830	WASHER
	55	PQ35026-1-2	IDLER LEVER
	56	PQ11659-1-10	SLIDE PLATE
	57	PQ46344A-2	CHANGE LEVER ASSEMBLY
	58	PQ21686	TAKE UP LEVER ASSEMBLY
	59	PQ46345	TAKE UP HEAD
	60	PQM30001-387106	TENSION SPRING
⚠	61	PU60628-3-2	MODE MOTOR
	62	SPSP3003Z	SCREW,X2
	63	PW30101-80AJ632	WIRE
	64	PQM30003-34-17	BELT
	65	PQ46395A	WORM GEAR ASSMBLY
	66	PQ21699	WORM BEARING
	67	SPST2606Z	SCREW
⚠	68	PU61435	CAPSTAN MOTOR
	69	PQ46347B-8	SUB DECK ASSEMBLY
	70	SPSG2608Z	SCREW,X3
	71	PQ46356A-1	CAPSTAN BRAKE ASSEMBLY
	72	SPST2606Z	SCREW,X3
	73	PQM30001-384101	TENSION SPRING,C.BRAKE
	74	PQ46353A-1	CHANGE ARM ASSEMBLY
	75	PQ46354	CHANGE GEAR
	76	PQM30001-386	TENSION SPRING
	77	PQM30003-35	BELT
	78	PQ46355	CASSETTE GEAR
	79	PQ35030	LID GUIDE
	80	PQ21689	LED PRISM
	81	PEHE0237	FULL ERASE HEAD
	82	SDST2610Z	SCREW
	83	PU61432-1-1	ROTARY ENCODER
	85	PQ46436A-1	CLEANER ASSEMBLY
	85A	PQ46418-1-2	CLEANER ROLLER
	85B	PQ46419-1-2	CLEANER
	85C	PQ35159-1-1	CLEANER ARM
	86	PQ43546-1-2	MOTOR PULLEY
	87	PQ35217-1-2	CONTROL BRACKET 2
	99	PQ21680B-14	MAIN DECK ASSEMBLY

5.4 ELECTRICAL PARTS LIST

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OPERATION BOARD ASSEMBLY <01>

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
PWBA	PZ06B01476A2	OPERATION BOARD ASSY,P70K P60K	
	PZ06B01476A3	OPERATION BOARD ASSY,P50A	
	PZ06B01476A4	OPERATION BOARD ASSY,P40A P101EE	
D801	SLR-332MG3F	LED PLAY	
D802	SLR-332VR3F	LED REC	
D803	SPR-39MVWF	LED POWER/STAND BY	
R801	QRD161J-301	RESISTOR	300,1/4W J
R802	QRD161J-431	RESISTOR	430,1/4W J
R803	QRD161J-561	RESISTOR	560,1/4W J
R804	QRD161J-821	RESISTOR	820,1/4W J
R805	QRD161J-152	RESISTOR	1.5K,1/4W J
R806	QRD161J-302	RESISTOR	3K,1/4W J
R807	QRD161J-912	RESISTOR	9.1K,1/4W J
R808	QRD161J-151	RESISTOR	150,1/4W J
R809	QRD161J-201	RESISTOR	200,1/4W J
R810	QRD161J-151	RESISTOR	150,1/4W J
R811	QRD161J-201	RESISTOR	200,1/4W J
R812	QRD161J-103	RESISTOR,P70K P60K P50A	10K,1/4W J
C801	PZ0CP28470MT	E CAPACITOR	47u/10 M
HD801	PQ43213	LED HOLDER,X2	
HD802	PQ46096	LED HOLDER	
CN801	PZ08N40900A8	CONNECTOR	
Z801	PZ08R39983A1	IR DITECT UNIT	
SW801	PZ08F45833T1	SWITCH POWER	
SW802	PZ08F45833T1	SWITCH STOP/EJECT	
SW803	PZ08F45833T1	SWITCH SCENE FINDER/KARAOKE SERCH	
SW804	PZ08F45833T1	SWITCH REW	
SW805	PZ08F45833T1	SWITCH FF	
SW806	PZ08F45833T1	SWITCH REC	
SW807	PZ08F45833T1	SWITCH STILL/PAUSE	
SW808	PZ08F45833T1	SWITCH PLAY	
SW809	PZ01F45604A1	SWITCH,P70K P60K P50A COLOR SYSTEM OUTPUT	
SW809	PZ01F45605A1	SWITCH,P40A P101EE COLOR SYSTEM OUTPUT	
SW810	PZ01F45605A1	SWITCH,P70K P60K TAPE SPEED	

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MAIN BOARD ASSEMBLY <03>

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION
PWBA	PZ06B01475A1	MAIN BOARD ASSEMBLY,HR-P70K
	PZ06B01475A2	MAIN BOARD ASSEMBLY,HR-P60K
	PZ06B01475A3	MAIN BOARD ASSEMBLY,HR-P50A
	PZ06B01475A4	MAIN BOARD ASSEMBLY,HR-P40A P101EE

- VIDEO(PRE AMP)SECTION -

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
IC001	BA7180AS	IC	
Q001	2SC1740S(QRS)	TRANSISTOR	
Q002	2SC1740S(QRS)	TRANSISTOR	
Q003	2SC1740S(QRS)	TRANSISTOR	
Q004	2SC1740S(QRS)	TRANSISTOR	
Q005	2SC1740S(QRS)	TRANSISTOR	
Q006	DTC144TS	TRANSISTOR	
Q007	2SC1740S(QRS)	TRANSISTOR	
Q012	DTA114ES	TRANSISTOR	
D001	1SS120TE	DIODE	
R004	QRD161J-302	RESISTOR	3K,1/4W J
R005	QRD161J-332	RESISTOR	3.3K,1/4W J
R006	QRD161J-103	RESISTOR	10K,1/4W J
R007	QRD161J-682	RESISTOR	6.8K,1/4W J
R008	QRD161J-471	RESISTOR	470,1/4W J
R009	QRD161J-122	RESISTOR	1.2K,1/4W J
R010	QRD161J-391	RESISTOR	390,1/4W J
R011	QRD161J-181	RESISTOR	180,1/4W J
R012	QRD161J-622	RESISTOR	6.2K,1/4W J
R013	QRD161J-122	RESISTOR	1.2K,1/4W J
R016	QRD161J-302	RESISTOR	3K,1/4W J
R017	QRD161J-302	RESISTOR	3K,1/4W J
R018	QRD161J-561	RESISTOR	560,1/4W J
R019	QRD161J-561	RESISTOR	560,1/4W J
R020	QRD161J-102	RESISTOR	1K,1/4W J
R021	QRD161J-511	RESISTOR	510,1/4W J
R022	QRD161J-102	RESISTOR	1K,1/4W J
R023	QRD161J-301	RESISTOR	300,1/4W J
R024	QRD161J-102	RESISTOR	1K,1/4W J
R025	QRD161J-102	RESISTOR	1K,1/4W J
R026	QRD161J-394	RESISTOR	390K,1/4W J
R027	QRD161J-182	RESISTOR	1.8K,1/4W J
R028	QRD161J-623	RESISTOR,P70K P60K	62K,1/4W J
R028	QRD161J-513	RESISTOR,P50A P40A P101EE	51K,1/4W J
C005	PZ0GM96104ZF	CAPACITOR	0.1u/25 Z
C006	QCF31HP-103Z	CAPACITOR	0.01u/50 Z
C008	QCS31HJ-121	CAPACITOR	120p/50 J
C009	QCS31HJ-560	CAPACITOR	56p/50 J
C010	QCVB1CN-103Y	CAPACITOR	0.01u/16 N
C011	QCS31HJ-221	CAPACITOR	220p/50 J
C012	QCS31HJ-820	CAPACITOR	82p/50 J
C013	PZ0GM96104ZF	CAPACITOR	0.1u/25 Z
C014	PZ0GM96104ZF	CAPACITOR	0.1u/25 Z
C015	PZ0GM96104ZF	CAPACITOR	0.1u/25 Z
C016	PZ0KH81102KB	CAPACITOR	0.001u/50 K
C017	PZ0GM96104ZF	CAPACITOR	0.1u/25 Z
C018	QCSB1HJ-220Y	CAPACITOR	22p/50 J
C019	PZ0KH81102KB	CAPACITOR	0.001u/50 K
C020	PZ0GM96104ZF	CAPACITOR	0.1u/25 Z
C021	QCSB1HJ-220Y	CAPACITOR	22p/50 J
C022	PZ0GM96104ZF	CAPACITOR	0.1u/25 Z
C023	QCS31HJ-330	CAPACITOR	33p/50 J
C024	PZ0GM96104ZF	CAPACITOR	0.1u/25 Z
C025	QCS31HJ-510	CAPACITOR	51p/50 J
C026	QCS31HJ-240	CAPACITOR	24p/50 J
C027	PZ0AK80470MW	E CAPACITOR	47u/6.3 M
C028	QCF31HP-103Z	CAPACITOR	0.01u/50 Z
C029	QCS31HJ-241	CAPACITOR	240u/50 J
C030	QCS31HJ-180	CAPACITOR	18p/50 J
C031	QCS31HJ-180	CAPACITOR	18p/50 J
C033	QCF31HP-103Z	CAPACITOR	0.01u/50 Z
C035	PZ0AK80101MW	E CAPACITOR	100u/6.3 M
C036	QCVB1CN-103Y	CAPACITOR	0.01u/16 N
C038	QCF31HP-103Z	CAPACITOR	0.01u/50 Z
L001	PZ00S82331KR	COIL	330uH K
L002	PZ00L138R2KT	COIL	8.2uH K
L003	PZ00S82181KR	COIL	180uH K
L004	PZ00L13680KT	COIL	68uH K
L005	PZ00L13560KT	COIL	56uH K
L006	PZ00L13180KT	COIL	18uH K

#△ REF No.	PART No.	PART NAME, DESCRIPTION		
L007	PZ00S82271KR	COIL	270uH	K
L008	PZ00L13180KT	COIL	18uH	K
L009	PZ00S82820KR	COIL	82uH	K
L010	PZ00K00820K0	PEAKING COIL	82uH	K
CN001	PZ08N40910A1	CONNECTOR		
SLD1	PZ06C03395A1	SHIELD CASE		
SLD2	PZ06D04066A1	SHIELD PLATE		

– VIDEO SECTION –

#△ REF No.	PART No.	PART NAME, DESCRIPTION		
IC101	HA118401CNT	IC		
IC102	MSM7460-60RS	IC,P40A P101EE		
IC102	MSM7460-61RS	IC,P70K P60K P50A		
Q103	2SC1740S(QRS)	TRANSISTOR		
Q104	2SA933S(QRS)	TRANSISTOR		
Q105	2SA933S(QRS)	TRANSISTOR		
Q106	2SA933S(QRS)	TRANSISTOR		
Q107	2SA933S(QRS)	TRANSISTOR		
Q108	2SC1740S(QRS)	TRANSISTOR		
Q109	2SC1740S(QRS)	TRANSISTOR		
Q110	DTC144ES	TRANSISTOR,P70K P60K		
Q201	DTC144ES	TRANSISTOR,P70K P60K		
Q202	2SA933S(QRS)	TRANSISTOR		
Q203	DTC143ES	TRANSISTOR,P70K P60K P50A		
Q204	DTC143ES	TRANSISTOR,P70K P60K		
D101	1SS120TE	DIODE		
D102	1SS120TE	DIODE		
D103	1SS120TE	DIODE		
D201	1SS120TE	DIODE		
R101	QRD161J-472	RESISTOR	4.7K,1/4W	J
R102	QRD161J-223	RESISTOR	22K,1/4W	J
R103	QRD161J-622	RESISTOR	6.2K,1/4W	J
R104	QRD161J-152	RESISTOR	1.5K,1/4W	J
R107	QRD161J-222	RESISTOR	2.2K,1/4W	J
R108	QRD161J-102	RESISTOR	1K,1/4W	J
R109	QRD161J-102	RESISTOR	1K,1/4W	J
R110	QRD161J-272	RESISTOR	2.7K,1/4W	J
R111	QRD161J-273	RESISTOR	27K,1/4W	J
R112	QRD161J-273	RESISTOR	27K,1/4W	J
R113	QRD161J-392	RESISTOR	3.9K,1/4W	J
R114	QRD161J-332	RESISTOR	3.3K,1/4W	J
R115	QRD161J-682	RESISTOR	6.8K,1/4W	J
R116	QRD161J-102	RESISTOR	1K,1/4W	J
R117	QRD161J-302	RESISTOR	3K,1/4W	J
R118	QRD161J-123	RESISTOR	12K,1/4W	J
R119	QRD161J-102	RESISTOR	1K,1/4W	J
R120	QRD161J-361	RESISTOR	360,1/4W	J
R121	QRD161J-750	RESISTOR	75,1/4W	J
R122	QRD161J-102	RESISTOR	1K,1/4W	J
R123	QRD161J-272	RESISTOR	2.7K,1/4W	J
R124	QRD161J-202	RESISTOR	2K,1/4W	J
R125	QRD161J-821	RESISTOR	820,1/4W	J
R126	QRD161J-821	RESISTOR	820,1/4W	J
R127	QRD161J-162	RESISTOR	1.6K,1/4W	J
R128	QRD161J-152	RESISTOR	1.5K,1/4W	J
R129	QRD161J-750	RESISTOR	75,1/4W	J
R130	QRD161J-182	RESISTOR	1.8K,1/4W	J
R131	QRD161J-102	RESISTOR	1K,1/4W	J
R132	QRD161J-101	RESISTOR	100,1/4W	J
R133	QRD161J-473	RESISTOR	47K,1/4W	J
R134	QRD161J-473	RESISTOR	47K,1/4W	J
R135	QRD161J-331	RESISTOR	330,1/4W	J

#△ REF No.	PART No.	PART NAME, DESCRIPTION		
R201	QRD161J-182	RESISTOR	1.8K,1/4W	J
R202	PZ0EL70472MX	CAPACITOR	4700p/16	M
R205	QRD161J-821	RESISTOR	820,1/4W	J
R206	QRD161J-152	RESISTOR	1.5K,1/4W	J
R208	QRD161J-331	RESISTOR	330,1/4W	J
R209	QRD161J-102	RESISTOR	1K,1/4W	J
R210	QRD161J-182	RESISTOR	1.8K,1/4W	J
R211	QRD161J-273	RESISTOR	27K,1/4W	J
R214	QRD161J-472	RESISTOR	4.7K,1/4W	J
R216	QRD161J-103	RESISTOR	10K,1/4W	J
C101	QCSB1HJ-390Y	CAPACITOR	39p/50	J
C102	PZ0KK80R47MW	E CAPACITOR	0.47u/50	M
C103	PZ0KP28R22MT	E CAPACITOR	0.22u/50	M
C104	QCS31HJ-161	CAPACITOR	160p/50	J
C105	PZ0KP281R0MT	E CAPACITOR	1u/50	M
C106	QCF31HP-103Z	CAPACITOR	0.01u/50	Z
C107	QCF31HP-103Z	CAPACITOR	0.01u/50	Z
C108	QFLA1HJ-223	F CAPACITOR	0.22u/50	J
C109	PZ0KK803R3MW	E CAPACITOR	3.3u/50	M
C110	PZ0GM96104ZF	CAPACITOR	0.1u/25	Z
C111	PZ0KK801R0MW	E CAPACITOR	1u/50	M
C112	PZ0KK801R0MW	E CAPACITOR	1u/50	M
C113	PZ0AP28101MT	E CAPACITOR	100u/6.3	M
C114	QCVB1CN-103Y	CAPACITOR	0.01u/16	N
C115	QCVB1CN-103Y	CAPACITOR	0.01u/16	N
C116	PZ0AK80470MW	E CAPACITOR	47u/6.3	M
C117	QCS31HC-4R0	CAPACITOR	4p/50	C
C118	QCSB1HJ-220Y	CAPACITOR	22p/50	J
C119	PZ0KK803R3MW	E CAPACITOR	3.3u/50	M
C120	QCVB1CN-103Y	CAPACITOR	0.01u/16	N
C121	PZ0KK80R47MW	E CAPACITOR	0.47u/50	M
C122	PZ0KK80R22MW	E CAPACITOR	0.22u/50	M
C123	PZ0AK80470MW	E CAPACITOR	47u/6.3	M
C124	QCVB1CN-103Y	CAPACITOR	0.01u/16	N
C125	PZ0CQ92220MT	E CAPACITOR	22u/10	M
C126	PZ0EP28100MT	E CAPACITOR	10u/16	M
C127	QCVB1CN-103Y	CAPACITOR	0.01u/16	N
C128	QCVB1CN-103Y	CAPACITOR	0.01u/16	N
C129	QCVB1CN-103Y	CAPACITOR	0.01u/16	N
C130	PZ0CP28470MT	E CAPACITOR	47u/10	M
C131	PZ0CQ96471M1	E CAPACITOR	470u/10	M
C132	PZ0EP28100MT	E CAPACITOR	10u/16	M
C133	QCS31HJ-470	CAPACITOR	47p/50	J
C134	PZ0KK803R3MW	E CAPACITOR	3.3u/50	M
C135	PZ0GM96104ZF	CAPACITOR	0.1u/25	Z
C136	PZ0CP28470MT	E CAPACITOR	47u/10	M
C138	QCF31HP-103Z	CAPACITOR	0.01u/50	Z
C139	QCVB1CN-103Y	CAPACITOR	0.01u/16	N
C201	PZ0KH81102KB	CAPACITOR	0.001u/50	K
C202	QCS31HJ-101	CAPACITOR	100p/50	J
C205	QFLA1HJ-153	F CAPACITOR	0.015u/50	J
C206	QCVB1CN-103Y	CAPACITOR	0.01u/16	N
C207	PZ0KP281R0MT	E CAPACITOR	1u/50	M
C208	QCS31HJ-391	CAPACITOR	390p/50	J
C209	PZ0KP283R3MT	E CAPACITOR	3.3u/50	M
C210	PZ0AP28470MT	E CAPACITOR	47u/6.3	M
C211	QCVB1CN-103Y	CAPACITOR	0.01u/16	N
C212	QCS31HJ-181	CAPACITOR	180p/50	J
C213	QCSB1HJ-330Y	CAPACITOR	33p/50	J
C214	PZ0AP28470MT	E CAPACITOR	47u/6.3	M
C215	QFLA1HJ-563	F CAPACITOR	0.056u/50	J
C216	QFLA1HJ-333	F CAPACITOR	0.033u/50	J

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
C217	PZ0KP28R47MT	E CAPACITOR	0.47u/50 M
C218	PZ0KH81152KB	CAPACITOR	1500p/50 K
C219	QCSB1HJ-100Y	CAPACITOR	10p/50 J
C220	QCS31HJ-120	CAPACITOR	12p/50 J
C221	QFLA1HJ-223	F CAPACITOR	0.22u/50 J
C222	PZ0KP28R47MT	E CAPACITOR	0.47u/50 M
C223	QCVB1CN-103Y	CAPACITOR	0.01u/16 N
C224	QCVB1CN-103Y	CAPACITOR	0.01u/16 N
C225	PZ0EP28100MT	E CAPACITOR	10u/16 M
C226	PZ0GM96104ZF	CAPACITOR	0.1u/25 Z
C227	QFLA1HJ-102	F CAPACITOR	1000p/50 J
C228	QCSB1HK-3R9Y	CAPACITOR	3.9p/50 K
C229	PZ00S82102KR	COIL	1000uH K
C230	QCVB1CN-103Y	CAPACITOR	0.01u/16 N
C232	QCVB1CN-103Y	CAPACITOR	0.01u/16 N
C233	PZ0AP28470MT	E CAPACITOR	47u/6.3 M
L101	PZ00L13820KT	COIL	820uH K
L102	PZ00L132R2MT	COIL	2.2uH M
L103	PZ00L13101KT	COIL	100uH K
L104	PZ00L13680KT	COIL	68uH K
L105	PZ00K00820K0	PEAKING COIL	82uH K
L106	PZ00L13220KT	COIL	22uH K
L107	PZ00L13101KT	COIL	100uH K
L108	PZ00L13820KT	COIL	82uH K
L201	QCSB1HJ-180Y	CAPACITOR	18p/50 J
L202	PZ00S82331KR	COIL	330uH K
L203	PZ00K00820K0	PEAKING COIL	82uH K
L204	PZ00S81120J1	COIL	12uH J
L205	PZ00L13100KT	COIL	10uH K
L206	PZ00L13390KT	COIL	39uH K
JA101	PZ08N42800A1	JACK BOARD	
MD101	PZ06F38606A1	RF CONVERTOR(G/K),P60K P50A P40A P101EE	
MD101	PZ06F38607A1	RF CONVERTOR(I/K),P70K	
W101	PZ06D03245A1	WIRE,P50A P40A P101EE	
X201	PZ01F38618A1	OSCILLATOR	
X202	PZ01F38619A1	OSCILLATOR,P50A	
X202	PZ01F38620A1	OSCILLATOR,P70K P60K	

- AUDIO SECTION -

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
IC301	LA7297	IC	
Q301	DTC144ES	TRANSISTOR,P70K P60K	
Q302	2SC1740S(QRS)	TRANSISTOR	
Q303	DTA144ES	TRANSISTOR	
Q304	DTC114TS	TRANSISTOR	
D301	1SS120TE	DIODE	
R301	QRD161J-100	RESISTOR	10,1/4W J
R302	QRD161J-273	RESISTOR	27K,1/4W J
R303	QRD161J-334	RESISTOR	330K,1/4W J
R304	QRD161J-221	RESISTOR	220,1/4W J
R305	QRD161J-113	RESISTOR	11K,1/4W J
R306	QRD161J-205	RESISTOR	2M,1/4W J
R307	QRD161J-123	RESISTOR	12K,1/4W J
R308	QRD161J-103	RESISTOR	10K,1/4W J
R309	QRD161J-122	RESISTOR	1.2K,1/4W J
R310	QRD161J-102	RESISTOR	1K,1/4W J
R311	QRD161J-473	RESISTOR	47K,1/4W J
R312	QRD161J-133	RESISTOR	13K,1/4W J
R313	QRD161J-222	RESISTOR	2.2K,1/4W J
R314	QRD161J-221	RESISTOR	220,1/4W J
R315	QRD161J-103	RESISTOR	10K,1/4W J
R316	QRD161J-272	RESISTOR	2.7K,1/4W J
R317	QRD161J-752	RESISTOR	7.5K,1/4W J
R318	QRD161J-103	RESISTOR	10K,1/4W J
R319	QRD161J-4R7	RESISTOR	4.7,1/4W J
R320	QRD161J-562	RESISTOR	5.6K,1/4W J
R321	QRD161J-681	RESISTOR,P70K P60K	680,1/4W J
R322	QRD161J-680	RESISTOR	68,1/4W J
R323	QRD161J-181	RESISTOR	180,1/4W J
R324	QRD161J-750	RESISTOR,P70K P60K	75,1/4W J
R325	QRD161J-563	RESISTOR	56K,1/4W J
VR301	PZ00H03103TB	V RESISTOR,P70K P60K BIAS ADJ.	
VR301	PZ0BK10152JT	RESISTOR,P50A P40A P101EE	1.5K,1/4W J
C301	QSF31HP-223Z	CAPACITOR	0.022u/50 Z
C302	PZ0KH81122KB	CAPACITOR	0.012u/50 K
C303	PZ0EP28100MT	E CAPACITOR	10u/16 M
C304	QFLA1HJ-103	F CAPACITOR	0.01u/50 J
C305	PZ0EP28220MT	E CAPACITOR	22u/16 M
C306	PZ0KP281R0MT	E CAPACITOR	1u/50 M
C307	PZ0EP28470MT	E CAPACITOR	47u/16 M
C308	PZ0KH81102KB	CAPACITOR	0.001u/50 K
C309	PZ0KH81222KB	CAPACITOR	2200p/50 K
C310	PZ0KP281R0MT	E CAPACITOR	1u/50 M
C311	PZ0KP284R7MT	E CAPACITOR	4.7u/50 M
C312	QFLA1HJ-153	F CAPACITOR	0.015u/50 J
C313	PZ0KP281R0MT	E CAPACITOR	1u/50 M
C314	PZ0EP28470MT	E CAPACITOR	47u/16 M
C315	PZ0GM96104ZF	CAPACITOR	0.1u/25 Z
C316	PZ0EP28470MT	E CAPACITOR	47u/16 M
C317	PZ0KP282R2MT	E CAPACITOR	2.2u/50 M
C318	QFLA1HJ-103	F CAPACITOR	0.01u/50 J
C319	PZ0KH81472KB	CAPACITOR	4700p/50 K
C320	PZ0EP28100MT	E CAPACITOR	10u/16 M
C321	QCS31HJ-561	CAPACITOR	560p/50 J
C322	QFLA1HJ-563	F CAPACITOR	0.056u/50 J
C323	QFLA1HJ-123	F CAPACITOR	0.012u/50 J
C324	QFLA1HJ-563	F CAPACITOR,P70K P60K	0.056u/50 J
C325	PZ0KP28R47MT	E CAPACITOR,P70K P60K	0.47u/50 M
C326	PZ0KH81152KB	CAPACITOR,P70K P60K	1500p/50 K
L301	PZ00P00391K2	PEAKING COIL	390uH K
L302	PZ00R18922C2	RF COIL	6800uH J
CN301	PZ00N40848A7	CONNECTOR	
CN302	PZ00N40848A2	CONNECTOR	
T301	PZ06F16576A1	OSC TRANS	

- KARAOKE SECTION -

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
IC401	BA7725S	IC,P70K P60K	
IC402	BU9252S	IC,P70K P60K	
IC451	BA335	IC,P70K P60K	
Q401	DTA114ES	TRANSISTOR,P70K P60K	
Q402	DTC114ES	TRANSISTOR,P70K P60K	
Q403	DTA144TS	TRANSISTOR,P70K P60K	
Q404	DTC114TS	TRANSISTOR,P70K P60K	
D401	1SS120TE	DIODE,P70K P60K	
D402	1SS120TE	DIODE,P70K P60K	
D403	1SS120TE	DIODE,P70K P60K	
R401	QRD161J-473	RESISTOR,P70K P60K	47K,1/4W J
R402	QRD161J-753	RESISTOR,P70K P60K	75K,1/4W J
R403	QRD161J-153	RESISTOR,P70K P60K	15K,1/4W J
R404	QRD161J-153	RESISTOR,P70K P60K	15K,1/4W J
R405	QRD161J-153	RESISTOR,P70K P60K	15K,1/4W J
R406	QRD161J-153	RESISTOR,P70K P60K	15K,1/4W J
R407	QRD161J-153	RESISTOR,P70K P60K	15K,1/4W J

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION
R408	QRD161J-153	RESISTOR,P70K P60K 15K,1/4W J
R409	QRD161J-562	RESISTOR,P70K P60K 5.6K,1/4W J
R410	QRD161J-223	RESISTOR,P70K P60K 22K,1/4W J
R411	QRD161J-513	RESISTOR,P70K P60K 51K,1/4W J
R412	QRD161J-752	RESISTOR,P70K P60K 7.5K,1/4W J
R413	QRD161J-103	RESISTOR,P70K P60K 10K,1/4W J
R414	QRD161J-102	RESISTOR,P70K P60K 1K,1/4W J
R415	QRD161J-104	RESISTOR,P70K P60K 100K,1/4W J
R451	QRD161J-103	RESISTOR,P70K P60K 10K,1/4W J
R452	QRD161J-912	RESISTOR,P70K P60K 9.1K,1/4W J
R453	QRD161J-474	RESISTOR,P70K P60K 470K,1/4W J
R454	QRD161J-103	RESISTOR,P70K P60K 10K,1/4W J
C401	PZ0EP28470MT	E CAPACITOR,P70K P60K 47u/16 M
C402	PZ0EP28220MT	E CAPACITOR,P70K P60K 22u/16 M
C403	PZ0KP28R10MT	E CAPACITOR,P70K P60K 0.1u/50 M
C404	PZ0KP28R47MT	E CAPACITOR,P70K P60K 0.47u/50 M
C405	QFLA1HJ-472	F CAPACITOR,P70K P60K 4700p/50 J
C406	QCS31HJ-331	CAPACITOR,P70K P60K 330p/50 J
C407	QFLA1HJ-183	F CAPACITOR,P70K P60K 0.018u/50 J
C408	PZ0KP281R0MT	E CAPACITOR,P70K P60K 1u/50 M
C409	PZ0GM96104ZF	CAPACITOR,P70K P60K 0.1u/25 Z
C410	QFLA1HJ-472	F CAPACITOR,P70K P60K 4700p/50 J
C411	QCS31HJ-331	CAPACITOR,P70K P60K 330p/50 J
C412	QFLA1HJ-183	F CAPACITOR,P70K P60K 0.018u/50 J
C413	PZ0KP28R47MT	E CAPACITOR,P70K P60K 0.47u/50 M
C414	PZ0KP28R10MT	E CAPACITOR,P70K P60K 0.1u/50 M
C415	PZ0KP281R0MT	E CAPACITOR,P70K P60K 1u/50 M
C416	PZ0KP284R7MT	E CAPACITOR,P70K P60K 4.7u/50 M
C417	PZ0AP28470MT	E CAPACITOR,P70K P60K 47u/6.3 M
C418	PZ0KH81102KB	CAPACITOR,P70K P60K 0.001u/50 K
C419	PZ0KP281R0MT	E CAPACITOR,P70K P60K 1u/50 M
C420	PZ0GK804R7MW	E CAPACITOR,P70K P60K 4.7u/25 M
C421	PZ0EK80100MW	E CAPACITOR,P70K P60K 10u/16 M
C451	PZ0KK801R0MW	E CAPACITOR,P70K P60K 1u/50 M
C452	PZ0KH81152KB	CAPACITOR,P70K P60K 1500p/50 K
C453	PZ0KH81472KB	CAPACITOR,P70K P60K 4700p/50 K
C454	PZ0KK80R47MW	E CAPACITOR,P70K P60K 0.47u/50 M
C456	PZ0EK80470MW	E CAPACITOR,P70K P60K 47u/16 M
L401	PZ00L13101KT	COIL,P70K P60K 101uH K
CN401	PZ08N40905A3	TRANSISTOR,P70K P60K
CN402	PZ08N40905A3	CONNECTOR,P50A
X401	PZ08J38964A1	OSCILLATOR,P70K P60K

– CONTROL SECTION –

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION
IC501	BU38703-0I	IC
IC502	IC-PST7039- T	IC
IC503	TA7291S	IC
Q501	DTC144VS	TRANSISTOR
Q502	DTA143XS	TRANSISTOR
Q503	DTA143XS	TRANSISTOR
Q504	DTA143XS	TRANSISTOR
Q505	DTA143XS	TRANSISTOR
Q506	PN268(NC)-VI	TRANSISTOR
Q507	PN268(NC)-VI	TRANSISTOR
D501	1SS120TE	DIODE
D502	1SS120TE	DIODE
D503	SIR-381SB3F	LED
	or SIR-381SB3FX1	LED
D504	1SS120TE	DIODE
R501	QRD161J-472	RESISTOR 4.7K,1/4W J
R502	QRD161J-472	RESISTOR 4.7K,1/4W J
R503	QRD161J-472	RESISTOR 4.7K,1/4W J
R506	QRD161J-472	RESISTOR 4.7K,1/4W J
R507	QRD161J-472	RESISTOR 4.7K,1/4W J
R508	QRD161J-102	RESISTOR 1K,1/4W J
R509	QRD161J-104	RESISTOR 100K,1/4W J
R510	QRD161J-102	RESISTOR 1K,1/4W J
R511	QRD161J-103	RESISTOR 10K,1/4W J
R512	QRD161J-103	RESISTOR 10K,1/4W J
R513	QRD161J-103	RESISTOR 10K,1/4W J
R514	QRD161J-104	RESISTOR 100K,1/4W J
R515	QRD161J-102	RESISTOR 1K,1/4W J
R516	QRD161J-331	RESISTOR 330,1/4W J
R517	QRD161J-561	RESISTOR 560,1/4W J
R518	QRD161J-683	RESISTOR 68K,1/4W J
R519	QRD161J-561	RESISTOR 560,1/4W J
R520	QRD161J-103	RESISTOR 10K,1/4W J
R521	QRD161J-473	RESISTOR 47K,1/4W J
R522	QRD161J-473	RESISTOR,P40A P101EE 47K,1/4W J
R523	QRD161J-473	RESISTOR,P70K P60K 47K,1/4W J
R524	QRD161J-332	RESISTOR 3.3K,1/4W J
R525	QRD161J-332	RESISTOR 3.3K,1/4W J
R527	QRD161J-473	RESISTOR 47K,1/4W J
R528	QRD161J-393	RESISTOR 39K,1/4W J
R529	QRD161J-103	RESISTOR 10K,1/4W J
R530	QRD161J-273	RESISTOR 27K,1/4W J
R532	QRD161J-124	RESISTOR 120K,1/4W J
R533	QRD161J-753	RESISTOR 75K,1/4W J
R534	QRD161J-622	RESISTOR 6.2K,1/4W J
R535	QRD161J-103	RESISTOR 10K,1/4W J
R536	QRD161J-103	RESISTOR 10K,1/4W J
R537	QRD161J-103	RESISTOR 10K,1/4W J
R538	QRD161J-103	RESISTOR 10K,1/4W J
R540	QRD161J-103	RESISTOR 10K,1/4W J
R541	QRD161J-472	RESISTOR 4.7K,1/4W J
R542	QRD161J-472	RESISTOR 4.7K,1/4W J
R543	QRD161J-472	RESISTOR 4.7K,1/4W J
R544	QRD161J-182	RESISTOR 1.8K,1/4W J
R545	QRD161J-103	RESISTOR 10K,1/4W J
R547	QRD161J-222	RESISTOR 2.2K,1/4W J
R548	QRD161J-103	RESISTOR 10K,1/4W J
R549	QRD161J-103	RESISTOR 10K,1/4W J
R550	QRD161J-750	RESISTOR 75,1/4W J
R551	QRD161J-333	RESISTOR 33K,1/4W J
R552	QRD161J-223	RESISTOR 22K,1/4W J
R553	QRD161J-221	RESISTOR 220,1/4W J
R554	QRD161J-221	RESISTOR 220,1/4W J
R555	QRD161J-104	RESISTOR 100K,1/4W J
R556	QRD161J-104	RESISTOR 100K,1/4W J
FR501	PZ0BL34R47KR	FUSIBLE RESISTOR 0.47,1/4W K
VR501	PZ00H03333TB	V RESISTOR, SW POINT ADJ.
C501	QCF31HP-103Z	CAPACITOR 0.01u/50 Z
C502	PZ0AK80470MW	E CAPACITOR 47u/6.3 M
C503	PZ0EK80100MW	E CAPACITOR 10u/16 M
C504	PZ0KH81222KB	CAPACITOR 2200p/50 K
C505	PZ0KK801R0MW	E CAPACITOR 1u/50 M
C506	QCVB1CN-103Y	CAPACITOR 0.01u/16 N
C507	PZ0AK80470MW	E CAPACITOR 47u/6.3 M
C508	PZ0AK80470MW	E CAPACITOR 47u/6.3 M
C509	PZ0KH81102KB	CAPACITOR 0.001u/50 K
C510	PZ0AK80470MW	E CAPACITOR 47u/6.3 M
C511	QCF31HP-103Z	CAPACITOR 0.01u/50 Z
C512	QCF31HP-103Z	CAPACITOR 0.01u/50 Z

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	C513	PZ0AK80470MW	E CAPACITOR	47u/6.3 M
	C514	QCF31HP-103Z	CAPACITOR	0.01u/50 Z
	C515	QFLA1HJ-103	F CAPACITOR	0.01u/50 J
	C516	QFLA1HJ-103	F CAPACITOR	0.01u/50 J
	C517	PZ0KH81472KB	CAPACITOR	4700p/50 K
	C518	PZ0KH81102KB	CAPACITOR	0.001u/50 K
	C519	PZ0KH80180JC	CAPACITOR	18p/50 J
	C520	PZ0KH80180JC	CAPACITOR	18p/50 J
	C521	PZ0EK80100MW	E CAPACITOR	10u/16 M
	C522	QCVB1CN-103Y	CAPACITOR	0.01u/16 N
	C523	PZ0GM96104ZF	CAPACITOR	0.1u/25 Z
	C526	QCF31HP-103Z	CAPACITOR	0.01u/50 Z
	C527	QCF31HP-103Z	CAPACITOR	0.01u/50 Z
	L502	PZ00L13101KT	COIL	100uH K
	L503	PZ00K00100K0	PEAKING COIL	10uH K
	L504	PZ00S822R2KR	COIL	2.2uH K
	L505	PZ00S822R2KR	COIL	2.2uH K
	CN501	PZ08R45951A1	CONNECTOR	
	CN502	PZ08N40905A2	CONNECTOR	
	CN503	PZ08R40968A1	CONNECTOR	
	CN504	PZ00N40848A2	CONNECTOR	
	CN505	PZ08N40905A8	CONNECTOR	
	X501	PZ01F38621A1	OSCILLATOR,8MHz	
	SW501	PZ08R45949A1	SWITCH CASSETTE SENSOR	
	SW502	PZ08R45950A1	SWITCH REC SAFETY SW	
	PC501	PS5707HR	PHOTO INTERRUPTER	
	PC502	PS5707HR	PHOTO INTERRUPTER	
	CAP501	PQ46408	SENSOR CAP,X2	

– POWER SECTION –

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
⚠	IC901	MA2830P-4104	IC	
	IC902	TA76431S-TPE6	IC	
⚠	IC951	STK50322	IC	
	Q901	2SA934(QR)	TRANSISTOR	
⚠	D901	S1WBA60	DIODE BRIDGE	
	D902	RB100A T-32	DIODE	
⚠	D903	HZS 7B3LTD	ZENER DIODE	
	D904	RB100A T-32	DIODE	
	D905	RB100A T-32	DIODE	
⚠	D951	RN2Z LF-A4	DIODE	
⚠	D952	11EQS06-TA1B2	DIODE	
⚠	D953	RB100A T-32	DIODE	
⚠	D954	HZS24 1LTD	ZENER DIODE	
⚠	D955	HZS16 3LTD	ZENER DIODE	
⚠	D956	MTZ9.1BT-77	ZENER DIODE	
⚠	D957	RZ1030 LF-B2	ZENER DIODE	
	R901	PZ0CH12105JH	RESISTOR	1M,1/2W J
	R902	PZ0DL09110JR	MF RESISTOR	11,1W J
	R903	PZ0EL09240JV	MF RESISTOR	24,2W J
	R904	PZ0CL04201JR	RESISTOR	200,1/2W J
	R905	QRD161J-471	RESISTOR	470,1/4W J
	R906	PZ0BK181202S	MF RESISTOR	12K,1/4W F
	R907	PZ0BK184701S	MF RESISTOR	4.7K,1/4W F
	R908	PZ0CL04151JR	RESISTOR	150,1/2W J
	R909	QRD161J-102	RESISTOR	1K,1/4W J
⚠	R910	PZ0FM322R2JN	CEMENT RESISTOR	2.2,3W J
	R911	PZ0CL04151JR	RESISTOR	150,1/2W J
	R912	PZ0DL09110JR	MF RESISTOR	11,1W J
	R913	PZ0EL09240JV	MF RESISTOR	24,2W J
	R914	PZ0EL09101JH	MF RESISTOR	100,2W J
⚠	R951	PZ0BL34R22KR	FUSIBLE RESISTOR	0.22,1/4W K
⚠	R952	PZ0BL34R22KR	FUSIBLE RESISTOR	0.22,1/4W K
⚠	R953	PZ0BL34R22KR	FUSIBLE RESISTOR	0.22,1/4W K
	R954	QRD161J-222	RESISTOR	2.2K,1/4W J
	R955	QRD161J-751	RESISTOR	750,1/4W J
⚠	C901	PZ0RT88104MS	F CAPACITOR	0.1u/250 M
⚠	C902	PZ0RT88104MS	F CAPACITOR	0.1u/250 M
⚠	C903	PZ0UP59680M1	E CAPACITOR	68u/400 M
⚠	C904	PZ00Q29222MF	CAPACITOR	2200p/250 K
⚠	C905	PZ00Q29222MF	CAPACITOR	2200p/250 K
	C906	PZ0ZQ49681KR	CAPACITOR	680p/1000 K
	C907	PZ0KP59100MT	E CAPACITOR	10u/50 M
	C908	PZ0KP59100MT	E CAPACITOR	10u/50 M
⚠	C909	PZ00Q29102KB	CAPACITOR	1000p/250 K
	C910	QFLA1HJ-103	F CAPACITOR	0.01u/50 J
	C951	PZ0GQ74471M1	E CAPACITOR	470u/25 M
	C952	PZ0EQ76271M1	E CAPACITOR	270u/16 M
	C953	PZ0EQ76681M1	E CAPACITOR	680u/16 M
	C954	PZ0AP28470MT	E CAPACITOR	47u/6.3 M
	C955	PZ0EP28470MT	E CAPACITOR	47u/16 M
	C956	PZ0EP28470MT	E CAPACITOR	47u/16 M
	C957	PZ0EP28470MT	E CAPACITOR	47u/16 M
	C958	PZ0EP28470MT	E CAPACITOR	47u/16 M
⚠	L901	PZ06F36611A2	LINE FILTER	
	L902	PZ06F16610A5	COIL	
⚠	CN901	PZ00F40916A1	CONNECTOR	
	HS901	PZ06D04049A1	RADIATOR	
	HS951	PZ06D04059A1	RADIATOR	
	HS952	PZ06D04116A1	RADIATOR SUB	
	HD901	PZ08J51870A1	CLIP,X2	
	HD902	PZ08F55924T1	FUSE CLIP,X2	
	SLD901	PZ06C03457A1	SHIELD (POWER)	
	SLD902	PZ06D04086A1	SHEET (POWER)	
	SCW901	PZ0FJ923012D	TAP SCREW,X2 3X12	
	SCW902	PZ0FJ923006D	TAP SCREW,X2 3X6	
⚠	F901	PZ00R32770A5	FUSE,250V 1.25A	
⚠	F902	PZ01F32612A1	FUSE THERMAL	
⚠	T901	PZ06F13612A1	TRANS	

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MIC BOARD ASSEMBLY <05>

PWBA	PZ06B01477A1	MIC BOARD ASSEMBLY,P70K	
	PZ06B01477A2	MIC BOARD ASSEMBLY,P60K	
IC601	BA4558N	IC,P70K P60K	
D601	1SS120TE	DIODE,P70K P60K	
D602	1SS120TE	DIODE,P70K P60K	
R601	QRD161J-472	RESISTOR,P70K P60K	4.7K,1/4W J
R602	QRD161J-472	RESISTOR,P70K P60K	4.7K,1/4W J
R603	QRD161J-473	RESISTOR,P70K P60K	47K,1/4W J
R604	QRD161J-103	RESISTOR,P70K P60K	10K,1/4W J
R605	QRD161J-823	RESISTOR,P70K P60K	82K,1/4W J
R606	QRD161J-104	RESISTOR,P70K P60K	100K,1/4W J
R607	QRD161J-104	RESISTOR,P70K P60K	100K,1/4W J
R608	QRD161J-242	RESISTOR,P70K P60K	2.4K,1/4W J
R609	QRD161J-682	RESISTOR,P70K P60K	6.8K,1/4W J
VR601	PZ03G20502GB	V RESISTOR,P70K P60K MIC VOLUME	
VR602	PZ03G20203GB	V RESISTOR,P70K P60K ECHO VOLUME	
C601	PZ0KH81222KB	CAPACITOR,P70K P60K	2200p/50 K

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION		
C602	PZ0KH81222KB	CAPACITOR,P70K P60K	2200p/50	K
C603	PZ0KP281R0MT	E CAPACITOR,P70K P60K	1u/50	M
C604	QCS31HJ-221	CAPACITOR,P70K P60K	220p/50	J
C605	PZ0EP28100MT	E CAPACITOR,P70K P60K	10u/16	M
C606	PZ0EP28100MT	E CAPACITOR,P70K P60K	10u/16	M
C607	QCS31HJ-820	CAPACITOR,P70K P60K	82p/50	J
C608	QFLA1HJ-223	F CAPACITOR,P70K P60K	0.22u/50	J
C609	PZ0EP28470MT	E CAPACITOR,P70K P60K	47u/16	M
C610	PZ0EP28100MT	E CAPACITOR,P70K P60K	10u/16	M
CN601	PZ08N40900A3	CONNECTOR,P70K P60K		
JA601	PZ01F42602A1	PHONE JACK,P70K P60K		

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RCA BOARD ASSEMBLY Only use HR-P50A <07>

PWBA	PZ06B01476A3	RCA BOARD ASSEMBLY
CN701	PZ08N40900A3	CONNECTOR
JA701	PZ01F42603A1	PIN JACK VIDEO IN
JA702	PZ01F42603A1	PIN JACK AUDIO IN

SECTION 6
TECHNICAL INFORMATIONS

6.1 SYSCON CIRCUIT

6.1.1 Syscon CPU pin function (IC501)

PIN No	LABEL	IN/OUT	NOTE
1	AD.Vss	-	GND (for A/D CONVERTER)
2	PG.MM	IN	SWITCHING PULSE
3	S.SENS	IN	Leader tape detect (Sensor on=L)
4	SW SP/$\overline{\text{LP}}$	IN	SW Standard Play/Long Play (SP=H)
5	NC	IN	NC
6	ENV.DET	IN	AUTO TRACKING DATA
7	E.SENS	IN	Trailer tape detect (Sensor on=L)
8	SW NTSC	IN	NTSC System select SW
9	KEY	IN	OPERATION BUTTON
10	AD.Vdd	-	System power (for A/D CONVERTER)
11	DFG OUT	OUT	DRUM FG OUT
12	DFG IN	IN	DRUM FG IN
13	DPG IN	IN	DRUM PG IN
14	CFG IN	IN	CAPSTAN FG IN
15	CFG OUT	OUT	CAPSTAN FG OUT
16	A.Vss	-	GND
17	Vref	-	REFERENCE VOLTAGE
18	CTL AMP(-)	IN	CTL AMP(-) input
19	CTL OUT	OUT	CONTROL PULSE OUT
20	CTL(-)	IN/OUT	CONTROL SIGNAL(-) IN/OUT
21	CTL(+)	IN/OUT	CONTROL SIGNAL(+) IN/OUT
22	A.Vdd	-	System power(for ANALOG)
23	RESET	IN	RESET at connect VCR to AC
24	GND	-	GND
25	A.EQ	OUT	AUDIO EQUALIZER control (PAL SP EE=H)
26	A.MUTE	OUT	AUDIO MUTE control (Mute on=L)
27	SERVICE	IN	SERVICE MODE control
28	P11/$\overline{\text{P11}}$	IN	System select ($\overline{\text{NTSC 3.58}}$/MULTI) control
29	P2/$\overline{\text{P2}}$	IN	System select (LP/$\overline{\text{LP}}$) control
30	$\overline{\text{EE}}$	OUT	EE mode (EE=L)
31	$\overline{\text{SP}}$	OUT	SP mode (SP=L)
32	$\overline{\text{REC-S}}$	OUT	REC START (REC START=L)
33	$\overline{\text{TV MUTE}}$	OUT	Picture mute control (MUTE on=L)
34	TV/$\overline{\text{VIDEO}}$	OUT	RF OUT Select (TV or VIDEO: TV=H)
35	LM R	OUT	LOADING MOTOR direction control (Reverse)
36	LM F	OUT	LOADING MOTOR direction control (Forward)
37	$\overline{\text{POWER LED}}$	OUT	POWER LED control (LED on=L)
38	V.SWP	OUT	VIDEO HEAD rotate (CH1=L)
39	NC	-	NC
40	NC	-	NC

Table 6-1-1-A SYSCON CPU pin function (1/2)

6.1.2 Syscon CPU pin function (IC501)

PIN No	LABEL	IN/OUT	NOTE
41	C ROT	OUT	CHROMA rotary signal
42	VP	OUT	V.PULSE addition timing control
43	Vdd	-	System power(for LOGIC)
44	DM PWM	OUT	DRUM SERVO error out
45	CM PWM	OUT	CAPSTAN SERVO error out
46	CM CONT	OUT	CAPSTAN MOTOR on/off control (on=H)
47	SLOW	OUT	CAPSTAN MOTOR SLOW control
48	DM CONT	OUT	DRUM MOTOR on/off CONTROL (on=H)
49	C.SENS	IN	Cassette detect (Sensor on=L)
50	POS.3	IN	Mechanism mode detect(SW 3)
51	POS.2	IN	Mechanism mode detect(SW 2)
52	POS.1	IN	Mechanism mode detect(SW 1)
53	POS.0	IN	Mechanism mode detect(SW 0)
54	TRP	IN	TAKE UP REEL PULSE
55	SRP	IN	SUPPLY UP REEL PULSE
56	REC SAF	IN	REC SAFETY SWITCH detect (Detect on=L)
57	BSD	IN	Blank Section Detect (Detect on=H)
58	NC	-	NC
59	$\overline{\text{STBY LED}}$	OUT	STand BY LED control (LED on=L)
60	$\overline{\text{PLAY LED}}$	OUT	PLAY LED control (LED on=L)
61	$\overline{\text{REC LED}}$	OUT	REC LED control (LED on=L)
62	CLK OUT	-	SYSTEM CLOCK(8.000MHz)
63	CLK IN	-	SYSTEM CLOCK(8.000MHz)
64	Vss	-	GND
65	NC	-	NC
66	NC	-	NC
67	NTSC 3.58	OUT	NTSC 3.58 mode (NTSC 3.58=H)
68	TRICK	OUT	Special PB mode (mode on=H)
69	MS DET	IN	MeSecam DETetct (Detect on=H)
70	NTSC	OUT	NTSC mode (NTSC=H)
71	V.CONT	OUT	Video clock Control
72	F/$\overline{\text{R}}$	OUT	CAPSTAN MOTOR direction control
73	REMOCON	IN	REMOTE CONTROL data input
74	NC	-	NC
75	V.DATA	OUT	Video serial Data
76	V.CLK	OUT	Video serial Clock
77	NC	-	NC
78	C.SYNC	IN	Composite SYNC detect
79	NC	OUT	NC
80	NC	-	NC [PB CTL Logic output]